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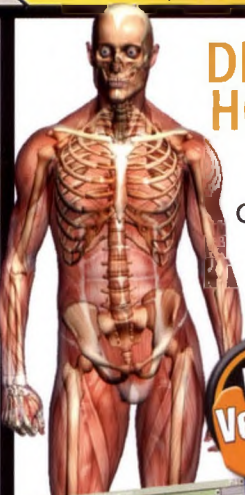
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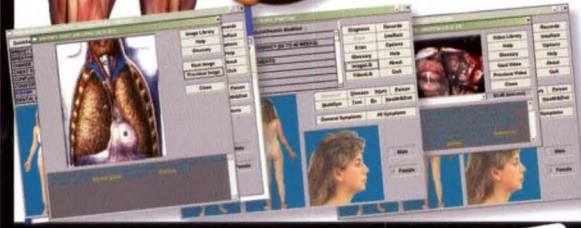


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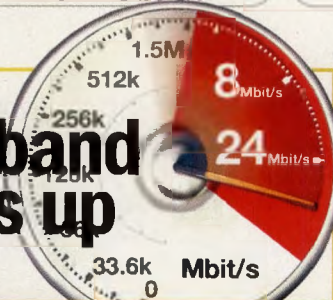
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Nick Race gets hands-on and has a first look at Nvidia's new flagship card.

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Broadband speeds up



Telstra's new higher-speed broadband means potentially faster downloads (plus, ADSL1 speed limits have been removed). Dan Warr reports.



VISTA-READY BUSINESS PCs



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TONY SARNO

Some of you may recall APC's Newswire site. This was a daily online news operation that worked alongside the magazine with its own separate staff in the late '90s. It was ahead of its time but, like many early projects on the net, revenue lagged behind — and it was shut down.

The site continued as an online archive of the magazine, automatically published to the web after the magazine came off the newsstands. Given that it cost little to produce, it was actually revenue-positive, but it wasn't something we were particularly proud of, so earlier this year we decided to shoot it and replace it with a real site.

This is now finally online: **apcmag.com** delivers the latest technical news and insights and the best product recommendations (plus, reader feedback is built into its very core).

When designing apcmag.com we decided to eschew Flash and Ajax-based eye candy for something lean, mean, fast and effective. We also wanted to keep apcmag.com's web platform technologies neutral — so an open source web content management system was specified. Our web developer, Declan Kennedy, made the call to go with Drupal, which proved to be an inspired decision. Drupal has ended up being a real surprise with its robustness and nicely integrated content administration.

The web site's editor, Dan Warne, has been driving the groundbreaking daily news and technical coverage that has had apcmag.com

regularly linked to by top global IT sites such as **slashdot.org** and **digg.com**. He's backed up by a great stable of specialists, ranging from Windows/Vista experts James Bannan and former editor David Flynn, to Mac expert Tim Gaden and Linux guru Ashton Mills. Nathan Davis (see staff file below) has been doing some great stuff with hardware coverage, and John Gillooly is now focused on delivering unique games coverage online.

But a new feature that really shows off the power of the site is Best Tech, which is run by APC's deputy editor, William Maher. Best Tech is based on our theory that users don't want product engines that return dozens and dozens of recommendations and comparisons. We think users expect us to do the work and point them to the very best products. *That's our job* as reviewers, and this is what Best Tech does. We have a version of Best Tech in the magazine that's a monthly snapshot of the best products. Best Tech online has more product categories (50 all up) and is updated around the clock.

Also, I must mention the hardware and pipes that combine to bring you apcmag.com. They rock. The server is a Sun Fire beast that has been provided by Sun Microsystems — it sits in the South Australian data centre of Internode, which is probably the most innovative ISP/telco in Australia. Check it out: apcmag.com.

tsarno@acpmagazines.com.au



WE THINK USERS EXPECT US TO DO THE WORK AND POINT THEM TO THE VERY BEST PRODUCTS — THAT'S OUR JOB

STAFF FILE

Name: Nathan Davis **Interests:** Science and technology, satire, music, gaming, archaeology, 42, and hailing Noodly Appendages **Favourite book:** Dictionary **Dream job:** Lara Croft's geek sidekick **Favourite quote:** "Never attribute to malice that which is adequately explained by stupidity."

I'm a mixed bag of nuts minus "a mixed bag of". I have a strong musical background, find mathematics fascinating and love cooking, writing, programming and scripting, 2D/3D graphics-play and going all universe-contemplative under the spell of a good red.

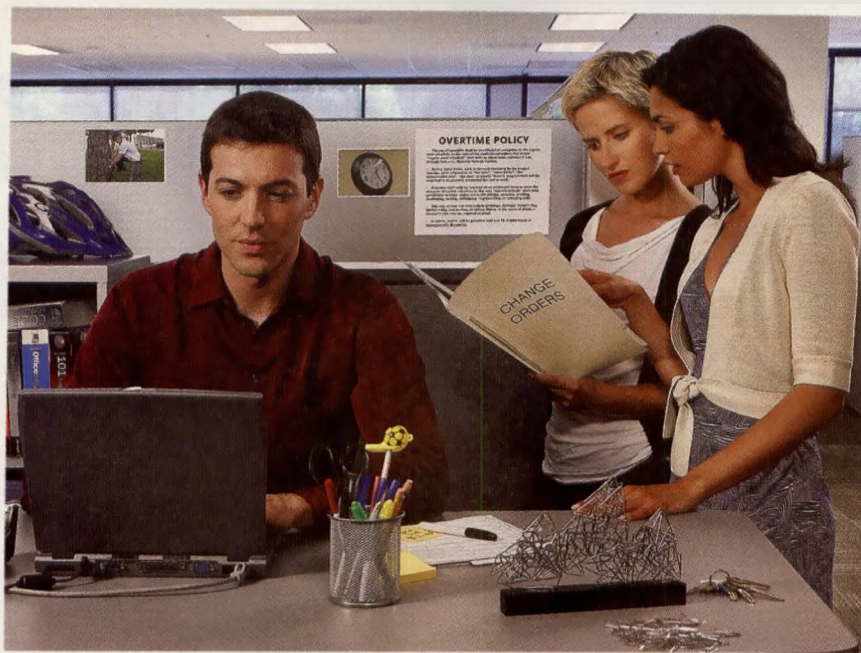
Originally targeting a life in network administration, I completed a semester of Cisco's CCNA. Tech journalism then grabbed me by the

face and wouldn't let go. It fits my face rather snugly, as I'm particularly fond of learning new and challenging technologies and lifting the lid on shenanigans that the IT world so voluptuously provides. Realistically, I've got my dream job.

My life goal is to become a successful philanthropist with a smug sense of superiority. I'm beginning to realise this is steep.



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AMD to build combined CPU and graphics chips

Finalising its acquisition of graphics giant ATI, AMD says it will create a single processor that consists of both a standard x86 CPU and a graphics processing unit.

Codenamed "Fusion", AMD's new combo processor is expected to be used in desktops, laptops, workstations, servers and some consumer electronics.

Considering this is partly an initiative to increase the performance per watt, Fusion may prove useful in the laptop market. Particularly so with Vista just around the corner, as it is the first version of Windows with an interface that natively uses 3D hardware.

Phil Hester, AMD's senior VP, remarked that future computing demands such a processor, saying, "simply adding more CPU cores to a baseline architecture will not be enough."

AMD expects its first Fusion processors to arrive in late 2008 or early 2009.

WHY FUSION?

We see two possibilities here. One is that Fusion will be aimed at the lower end of the performance market and will use standard system memory. The other is that Fusion will target the performance enthusiast and will require the use of next-generation memory. The former scenario is the more likely of the two.

As both processors will exist on the same piece of silicon, the bandwidth between CPU and GPU would be greatly increased. This is arguably a moot point, as the bandwidth currently offered via PCI Express and even AGP is sufficient.

How memory bandwidth will be addressed is an object of interest,



as memory on standard graphics cards is traditionally one or two generations above that of the system memory.

Intel itself hasn't announced any such processor yet, but, considering it already has its own GPU on the Northbridge chip, migrating this to the CPU may well

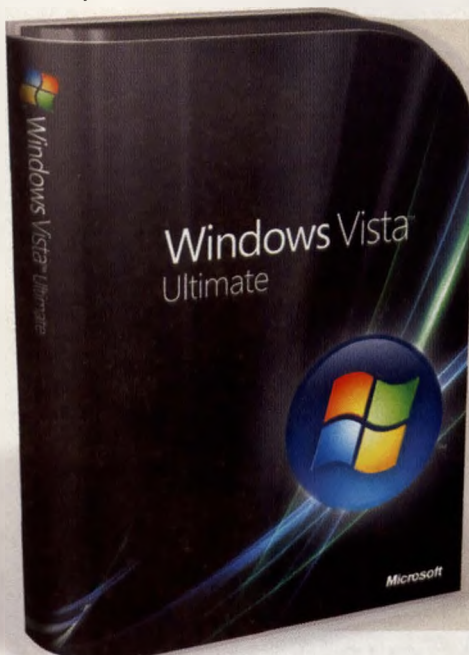
be in its sights, if only to keep AMD on its toes.

Having collected ex-employees of Stexar (a company formed by ex-Intel engineers familiar with x86 CPU architecture), Nvidia is rumoured to be working on a CPU.

This appears necessary for survival, as AMD now has its own fully fledged graphics and chipset department and Intel is actively expanding its own existing line of graphics engineers. If the rumour proves true, we may see a similar GPU/CPU processor on its road map soon.

However these fusion CPU/GPU processors turn out, AMD's announcement guarantees that other industry players will be forced to go in the same direction in order to maintain competition.

Nathan Davis



Windows Vista finished. . . at last!

After five long, painful and delayed years of development, Vista has finally been released to manufacturers.

The next-generation Windows was made available to business volume licence customers in late November and will be released to the rest of the population at the end of January.

If you've tried the beta and think you've seen it all, Microsoft has kept a few surprises up its sleeve. One is the new Windows sound theme by guitarist Robert Fripp. The rest is yet to come, and many will appear only in the hyper-expensive Vista Ultimate.

The rush is on now for device manufacturers to perfect drivers for all their hardware in the lead-up to the consumer launch. Some manufacturers have stated that they won't produce drivers for hardware older

than a few years (see www.apcmag.com for lots of coverage around Vista drivers and compatibility).

However, other companies have spotted an opportunity to make hardware to help extend the life of older PCs for Vista, which relies on a powerful graphics card to draw the user interface.

PowerColor has launched ATI's fastest graphics card — the Radeon X1950 Pro — in an AGP version for people who want to spec up their PC for Vista (without having to replace the motherboard — and the painful domino-effect of having to also replace the RAM, PSU, CPU and so on).

Nathan Davis and Dan Warne

TRUE OR FALSE? METAL FOIL DRIVES!

If one technology columnist is to be believed, metal foil will now be able to do much more than seal the moisture into last night's roast.

Famed US tech columnist Robert X. Cringely claims his new startup company can make faster, tougher and cheaper HDDs that use far less power than present drives (and store more within the same space).

Cringely's patented "Metal Foil Drive (MFD)" technology reduces disk platter thickness, using platters that are made of a thin, flexible foil, not rigid and heavy like today's glass or aluminium substrate platters. They're each one-tenth the usual mass, and this allows a more energy-efficient 1in drive motor to spin a 3.5in MFD.

Twice the amount of MFD platters can fit within the standard platter space, says Cringely, effectively

doubling the storage capacity — or halving the size.

Present drive read-write heads float on what is called an air bearing. This is a tiny pillow of air above the surface of a platter. In an MFD, the heads essentially fly over the platters, the air pressure causing the flexible platter to actually warp away from the head — this distance being the optimum point for accessing data.

This flying appears to keep the heads further away from the

platters than in present drives and, as a result, dust isn't a concern. Additionally, Cringely says, an operating MFD wouldn't notice if it were dropped.

Other intriguing claims include a faster access time than flash memory, operation at 100 degrees Celsius and 30,000rpm drives will be made for enthusiasts.

Cringely sees MFD having immense applications from data centres, PCs and laptops to mobile phones, automobiles (and even replacing tape drives).

Of course, there are many skeptics crying "too good to be true" about the claims. Cringely says MFDs will arrive "under well-known brand names" by this time next year.

Nathan Davis



Adobe wants the web in PDF

PDF may provide fixed layouts now, but Adobe wants it to become the basis of how web pages are presented.

Adobe and Microsoft have fired the opening shots in a struggle over how documents delivered over the web (and some web pages themselves) will be viewed in the future.

Microsoft's Windows Presentation Foundation (WPF) software, built into Vista and available as a service pack for Windows XP, is a display engine and .NET-dependent code framework for creating and displaying documents, media files and user interfaces.

The New York Times has already used it to create a reader, which displays content with the same layout and images as the broadsheet. However, unlike a simple newspaper page, it can reshuffle articles and picture sizes to accommodate different-sized screens.

WPF is coded in a proprietary XAML markup but has a big head start, with the advantage of being packaged into the world's most widely used operating system.

Adobe plans to take this behemoth on head-to-head with its Digital Editions software, a Rich Internet Application for ebook and document viewing.

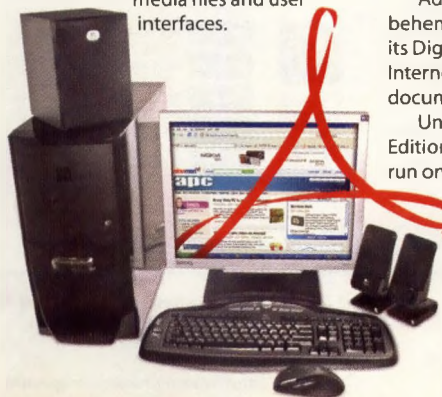
Unlike WPF, Adobe's Digital Editions is coded in Flash and will run on Windows, Linux and Mac operating systems. It offers support for open standards like PDF, XHTML and Flash SWF and will run happily even

on low-end machines (500MHz CPU, 128MB RAM). It is also bandwidth-friendly. The program is only 2.5MB, which includes Adobe Flash Player 9 (and takes less than two minutes to install on a broadband connection).

The current beta can reflow text and perform a few other tricks to enhance readability that are beyond Adobe Acrobat Reader 8 (with which Digital Editions integrates), but Adobe is promising more features to come: integrated social networking, browser-based operation and widgets, the "push" delivery of content subscriptions and webcasts, mobile and device versions and new ways of combining traditional text-based and interactive content. And perhaps it won't take quite as long to load as Acrobat Reader.

The way web-delivered content on your computer looks in five years may depend on who wins this battle.

Tim Gaden

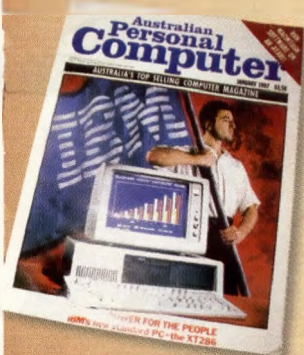


THE (A)PC REVOLUTION

January 1987

IBM XT 286 POWER TO THE PEOPLE

"CPU: Intel 80286 8MHz, RAM: 640K, Mass storage: 1.2MB FDD, 20MB HDD, Display: Mono, CGA, EGA. OS: PC DOS 3.2. Our perspective: The XT 286 has to compete not just with cheap AT clones offering more for less, but with cheap upgrade products."



TAKING THE WRAPS OFF THE AMIGA 2500

"Four IBM PC slots, connected to each other and nothing else, have been included in the latest computer from Commodore — the Amiga 2500... There will be room in the box for a lot more than today's single 3.5in floppy drive — in fact, there will be room for three disks, one of which can be a 5.25in drive."



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Microsoft	Windows XP Home SP2

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Graphics	Integrated
Microsoft	Windows XP Tablet Edition

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Microsoft	Windows XP Home SP2

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Graphics	Intel / ATI X1300 / ATI X1600 HDMI
Microsoft	Windows XP Media Centre

DreamBook Tough 230

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\$5599



Processor	Intel Core Duo
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Display	14.1"/15" SXGA TFT Screen
Graphics	Integrated / ATI Radeon 128MB
Microsoft	Windows XP Home

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Uhm... what am I doing, Dave?
I seem to be suffering a fault in the
Core 2 Duo processor. I seem to be a
few meg short of 4GB!



2007: a chip oddity

4GB RAM ain't 4GB RAM if your new Core 2 Duo PC comes with the common Intel 945PM chipset. *Tim Gaden reports.*

Computers with Intel's new Core 2 Duo chips inside come with the promise of support for a full 4GB of RAM — ideal for RAM-hungry Windows Vista and Mac OS X — but the promise isn't all that it seems.

It has transpired in recent weeks that while Intel's chipset (which controls various subsystems of the PC) technically does address up to 4GB, it reserves almost 800MB worth of RAM addresses for system devices, BIOS, VGA memory and additional motherboard resources, leaving only 3.24GB for the operating system.

PCI devices are especially memory-hungry. When the computer is booted, the chipset scans the buses to determine how much memory is needed for the

different PCI devices. If the amount of memory requested is more than around 230MB, the chipset may reserve up to 512MB RAM.

Graham Tucker, technical manager for Intel Australia, says that "no more optimisation is possible." Earlier chipsets could be tweaked through the BIOS to free up more addressable memory, but the memory management in current chipsets is packed tight.

Vendors have treated this aspect of the Core 2 Duo differently. Apple's new MacBook Pro can fit two 2GB DIMMs, but the company acknowledges that the notebook can only address 3GB.

HP markets its high-end Compaq nc8430 laptop as "upgradeable to 4,096MB maximum" (with restrictions for memory about

3GB only mentioned in a footnote). While waiting for a 3GB DIMM configuration to come onto the market, users face a choice between buying 2GB and using less than the full 3.24GB available or buying 4GB of RAM and sacrificing 800MB which will be unaddressable. A chart of 2GB and 4GB configurations from Intel's white paper on memory management, each with three different graphics configurations, makes the dilemma clear.

If 3.24GB is not enough, memory-hungry users will need to look at a 64-bit operating system such as Vista 64-bit or the upcoming Mac OS X 10.5 (and a chipset like Intel's Q965 or Q963 Express, which happily addresses up to 8GB of memory).

inbrief



QUAD-CORE HEATWAVE

Remember the difficulties everyone had cooling the Prescott-core Pentium 4 processors? They pulled about 130 watts of power, and Intel's big selling point for Core 2 Duo has been markedly lower power consumption (and therefore less heat output). The bad news is that Intel is projecting it will again hit 130W for its Core 2 Extreme quad-core processors. They should deliver smoking speed — literally.

HOW MUCH RAM DO YOU REALLY HAVE?

	2GB (INT GFX)	2GB (PCI GFX)	2GB (PCI-E GFX)	4GB (INT GFX)	4GB (PCI GFX)	4GB (PCI-E GFX)
MTRR: TOTAL WB MEMORY	2GB	2GB	2GB	4GB	4GB	4GB
SYSINFO: TOTAL PHYSICAL MEMORY	2,048MB	2,048MB	2,048MB	4,096MB	4,096MB	4,096MB
SYSINFO: AVAILABLE PHYSICAL MEMORY	1.73GB	1.75GB	1.73GB	2.99GB	2.97GB	3.01GB
TASKMAN: TOTAL PHYSICAL MEMORY	2,086,636KB	2,086,636KB	2,094,828KB	3,397,356KB	3,397,356KB	3,405,548KB
TASKMAN: AVAILABLE MEMORY	1,832,568KB	1,840,935KB	1,826,628KB	3,148,444KB	3,122,688KB	3,158,026KB
TOTAL RAM	1.99GB	1.99GB	2GB	3.24GB	3.25GB	3.25GB



Want to nominate a dumbest moment in tech?
Send an email with the subject line "Dumbest Moments" to dwarne@apc.com. All correspondence becomes the property of APC.

AUSSIE SPAM KING GETS FLAME-GRILLED BY COURTS

Australia's first successful prosecution under the Spam Act 2003 has slugged Perth man Wayne Mansfield with a personal fine of \$1 million and his company Clarity1 with a fine of \$4.5 million for sending an estimated 231 million spam emails since the Act came into force in April 2004.

Mansfield vigorously defended his actions when the charges were first laid in

June 2005, claiming that his "commercial emailing" was legitimate, that he hadn't harvested any emails since the Act came into force and that since recipients had not unsubscribed, they were pleased to get his spam.

He also pointed out that he was a popular guy; over 20,000 people attend his business seminars, he said at the time. Now that the king of "passive income generation" has some outgoings to consider, perhaps he will get the message.

Tim Gaden



NOKIA GETS GPS NAVIGATOR

If there was any doubt left in your mind that mobile phones would soon give you directions to where you're going, Nokia has not only announced its first GPS navigation phone (the N95), it has announced its first standalone and portable car GPS nav unit (Nokia 330). Both are not yet available, but show that the phone maker is intent on stealing away the success of TomTom, Navman and others.

THE CD IS DEAD; LONG LIVE THE CD

The chairman and CEO of EMI Music, Alain Levy, has shocked the music industry by telling the London Business School that the CD is dead. He says record companies can't just sell CDs: they'll have to add more value to beat the ease of downloads. He admits the CD will survive a little longer though, saying, "you won't buy granny iTunes downloads."



Extreme geek

All I want for Christmas is a drained power grid

Dean Collins plans to impress the neighbours with his Christmas lights.



Dean Collins is a 20-year-old software developer who has never completed any official certifications but has been tinkering with computers and electronics for 8+ years. He says: "I enjoy mixing different hobbies with computers, such as computers and Christmas, computers and cars (and robotics)."

THE CHALLENGE

To find a way to get the Christmas lights to flash in sync, either to a soundtrack or just in unison. Many products are available, but they're mainly US-based and very expensive. There had to be a better way.

THE SOLUTION

Whilst browsing for solutions, I found a design that did everything I needed (www.computerchristmas.com). It was a DIY solution, involving creating a set of linkable modules that talked to each other.

The project had to satisfy the following requirements:

- To be able to control a minimum of 128 channels.
- Switch a set of Christmas lights (either 240V or 24V) without overheating.
- Provide software in order to create displays.
- Price to be justifiable for seasonal use (sub-\$1,000).
- Once programmed it had to be fully automated.

PROJECT COSTS

Total project cost was \$980:

Motherboard (integrated CPU): \$300; PCB production: \$150;



electronic components: \$300; wiring, outlets, connectors: \$150; Cat5 to connect controllers: \$80.

STEP BY STEP

The first step was to find an efficient way to produce the controller PCBs. I used some copper-clad board, etchant and some photo paper.

I put the photo paper through a laser printer to produce a protective layer over the parts I wanted to keep. I then ironed the design onto the copper-clad board and put the board in the sink to soak for about an hour. The paper then peeled off leaving the toner from the laser printer on the board.

Once the board was clean and dry with the design completed, I put the board in the etchant — be careful, it's very corrosive. Once the copper started to dissolve, I used an old toothbrush to give it a helping hand. After the board was completely etched, I washed it with

running water and ensured all the etchant was gone.

Then, I dried the board and drilled the holes for the component legs and sockets. This is very tedious as there are over 400 holes per controller, and that is not including the Solid State Relays.

After the first controller board was complete I decided it would be wiser to look for a PCB production house that could make the boards, as I had one more controller and 64 SSR boards to go. I found a place to etch, drill, solder, mask and silk-screen the lot for around \$190, including delivery. They also provided the electronic components.

Once the new boards had arrived, it was time to start soldering — a good project to start in the winter, as each SSR has 61 solder points (so, combined with the controller boards, I had around 5,000 points to solder). If you can't solder when you start,

you'll definitely learn how by the time it's finished.

The controller boards are connected to the SSRs by regular Cat5 cables; this was because Cat5 is readily available and cheap. All the controllers are mounted on a central board and the Cat5 cable runs off to the individual SSR controllers.

Once all the boards are completed and set up, I needed a way to program and control them. For this, use a program called Vixen (www.vixenlights.com), which allows you to manage multiple boards as well as synchronise to music, have multiple compositions and also manage different types of boards all together.

This is a very rewarding project, but also a lot of work: it takes some knowledge of electronics and a lot of patience. **APC**



HOW GEEKY ARE YOU?

Have you wired up your car? Shared your home media library with five family members in three states? Made a 16 terabyte file server? If you've done something interesting with computing technology, APC wants to hear about it. Email a description of your project to dwarne@apcmagazines.com.au and include photos (we need at least one of you pictured with your gear). This month's Extreme Geek wins a NETGEAR WNR834B

RangeMax NEXT Wireless Router and a WN511B RangeMax NEXT Wireless Notebook Adapter (worth \$528 in total). This combination delivers unprecedented wireless speeds and complies with the draft 802.11n wireless standard. The RangeMax NEXT line offers users speeds 15 times greater than standard 802.11g products (with 10 times more wireless coverage). For more detail on NETGEAR, visit www.netgear.com.au.

WE TARGET



MALWARE

MICROSOFT.COM.AU/SECURITY/IT

Microsoft

Tools to help secure your network, where and when you need them

The Microsoft™ Malicious Software Removal Tool—over 16 million instances of malware removed and counting. Read the white paper, based on data collected by this effective tool. It arms you with a clear view of the security landscape, including the latest trends, threats, and countermeasures. Find it now at microsoft.com.au/security/IT

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Microsoft



Optus has the cheapest line rental

ADSL users take note: Optus now has the lowest line rental at \$19 (and it allows cheap calling too). Dan Warne reports.

If there's one thing that Australia's tech enthusiasts truly loathe, it's being forced to pay phone line rental just to get ADSL (when they're unlikely to make many calls on the line, anyway — in the VoIP era).

Now, Optus has come to the fore with a \$19 "HomeBasic" line rental (<http://snipurl.com/12m9u>) — cheaper than Telstra's

cheapest line rental at \$19.95. It is offering it to customers on its HFC cable network, or to people in telephone exchange areas where "Optus Direct" is offered (where your phone line is disconnected completely from Telstra's network and reconnected directly to Optus).

As a result, you can only get Optus Cable internet or Optus

Direct ADSL2+ with that line rental plan, but that's not a bad thing: Optus broadband plans are pretty good value.

The unique aspect of Optus' \$19 line rental plan is that Optus doesn't stop you from using telephone override codes on it to select another carrier to handle your calls. Most people have forgotten about this

functionality on phone lines — it's the four digit code starting with "14" that you can use to place a call through a different carrier at their call rates.

So, as long as you don't mind Optus internet, you can now get super-cheap line rental and choose the cheapest phone carrier for your calls when you do need to use the landline.

yes
yes
yes

Flat-rate broadband on mobile phones

Hutchison 3 has announced it will soon offer broadband internet on mobile phones for a flat monthly fee.

3's innovative flat-rate pricing model means that users will be able to make unlimited calls from their mobile using Skype, access TV from home using hardware like a Slingbox, or play movies and music from their home PC using Orb. They'll also be able to do instant messaging on Yahoo!, MSN Messenger and Google Talk.

3 Australia is yet to set local pricing or availability but promises that the price "will include all you can Skype, all you can chat by

instant text message and all you can search and browse". Additional charges will apply for the Sling and Orb services.

Hutchison Whampoa, 3 Australia's parent company, has put some videos online that explain more about it (<http://snipurl.com/12m10>). The company has also announced mobile broadband laptop card plans that are significantly faster and cheaper than Telstra's current Next G mobile broadband offerings.

Based on the High-Speed Downlink Packet Access (HSDPA) protocol, the 3 mobile plans (available on both compatible mobile phones and on computers through 3 mobile's new ExpressCard) will offer theoretical maximum speeds of 3.6Mbit/s from March 2007. That's twice as fast as the 1.5Mbit/s maximum on Next G, though Telstra has promised the same speed by early 2007.

The laptop card plans are roughly half the price of comparable Next G plans. The entry-level 200MB plan costs \$29/month, while Next G asks \$49.95/month for 200MB capped at 256Kbit/s. The mid-

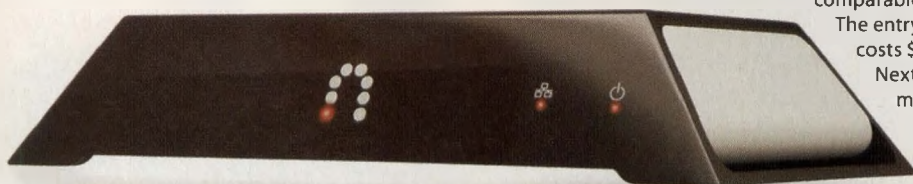
range plan from 3 mobile costs \$49 for 1GB, compared to Next G's \$109.95/month for 1GB, capped at 1.5Mbit/s.

At the top of the range, \$69 buys 2GB of data per month from 3 mobile. Next G's 3GB plan costs \$199.95/month.

Both providers charge for excess usage, but 3 mobile's 10c/MB compares well next to Next G's 30c/MB.

The speed and cost savings need to be set against the advantages of Telstra's wide national coverage. Outside 3's own coverage areas, the national roaming allowance on 3 mobile plans falls to just a few megabytes per month, with extra data charged at \$1.65/MB.

Tim Gaden



Protect your valuable hardware this Xmas.

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Fortron Powerguard Extreme Protection 8 Outlet PowerBoard

An 8 outlet powerboard like no other. Primary bank of 6 outlets is separated from the secondary bank of 2 outlets by an additional crossover filter, providing two separately isolated power outlets designed for your monitor and PC. AC Mains protection, over voltage, under voltage and surge protection provided by Active Intelligent Sensing.

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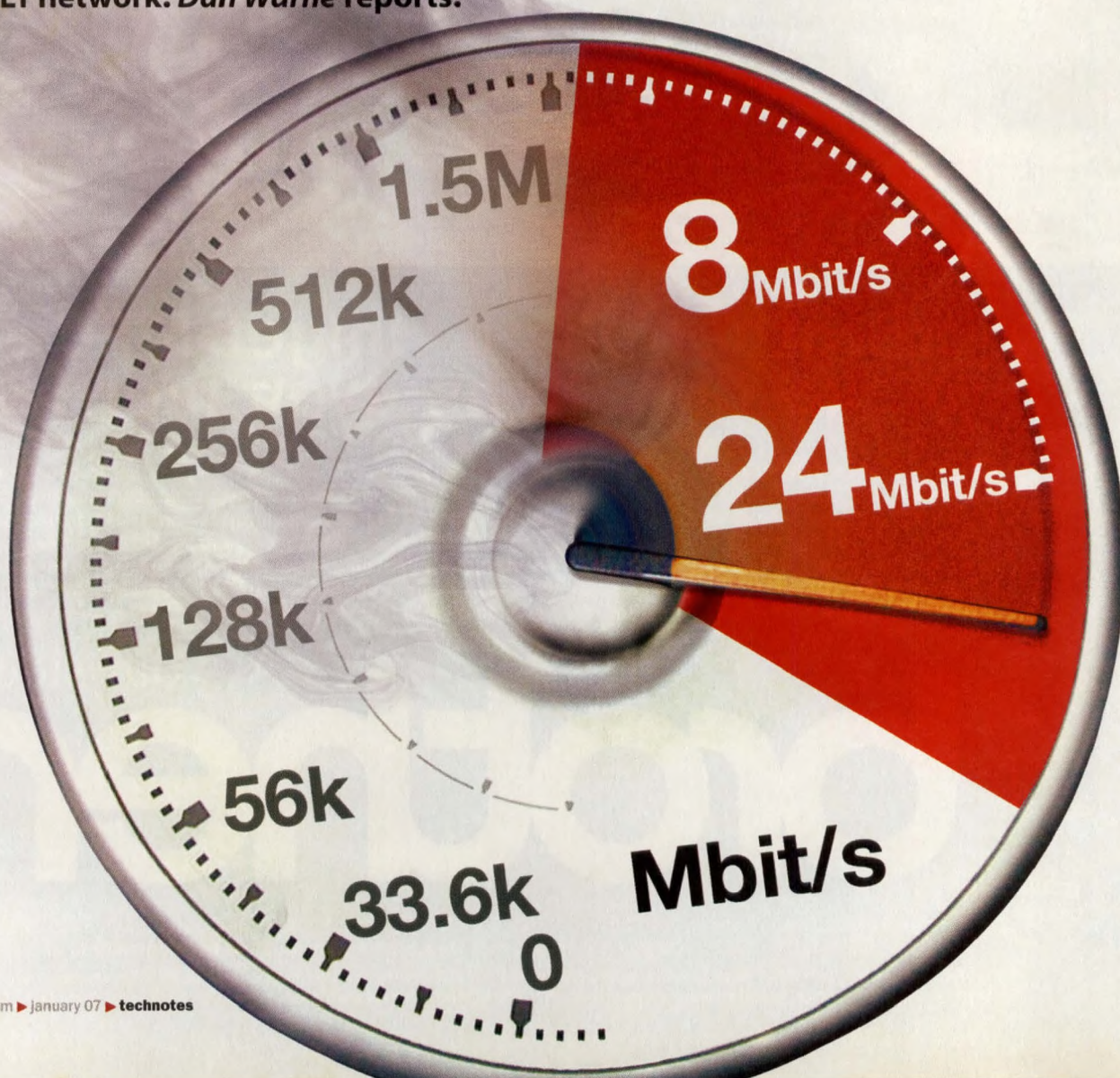
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TELSTRA'S NEW **superfast broadband** RELEASED

EVERY BROADBAND
CONNECTION NATIONWIDE
FREED FROM 1.5MBIT/S
SHACKLES!

Telstra's new higher-speed broadband means you'll be sucking down TV eps in minutes rather than hours and, although coverage is limited, the best part is that Telstra has also removed the speed limits on its national ADSL1 network. *Dan Warne reports.*





Live from LA: a word from the CEO, Sol Trujillo: "leading telco, etc., taking us into the future, etc., strategic alliances, etc., very fast broadband, etc., etc."

The prayers of frustrated 1.5Mbit/s broadband users have been answered: Telstra has announced it has launched ADSL2+ in 360 exchanges, covering 41 per cent of the population, and removed the speed caps on the remaining 2,400 ADSL1 exchanges, (covering 91 per cent). Yes, you read right: full, uncapped-speed ADSL1 virtually everywhere at up to 8Mbit/s. We've never been so excited about ADSL1 before — it's like cable internet being rolled out to every house in Australia.

Telstra isn't making its 20Mbit/s ADSL2+ service available for resale by other ISPs (see "Why Telstra's ADSL2+ coverage is so limited", right), but it is making the ADSL1 full-speed 8Mbit/s connections available to other ISPs at around the same price they used to pay for 1.5Mbit/s services. By the time you read this, there should be a large number of ISPs offering 8Mbit/s plans. Some have already announced pricing; the good news is it's only fractionally more expensive than the old 1.5Mbit/s plans.

There's even a speed boost up to at least 3Mbit/s for people who



WE'VE NEVER BEEN SO EXCITED ABOUT ADSL1 BEFORE — IT'S LIKE CABLE INTERNET BEING ROLLED OUT TO EVERY HOUSE IN AUSTRALIA

are unfortunate enough to have a phone line that goes via a Remote Integrated Multiplexer (RIM) or Customer Multiplexer (CMUX) — one of the green cabinets you see on the nature strip at the side of the road. In the past, these "street-side exchanges" have blocked access to any form of higher-speed broadband. Now, customers on them can sign up to the "up to 8Mbit/s" broadband. However, Telstra's fine print says that it doesn't have enough backhaul bandwidth to some of those RIMs/CMUXs, so it reserves the right to throttle people back to 3Mbit/s. But, hey — twice the speed you had before is better than nothing, right?

TO JOIN BIGPOND, OR NOT TO JOIN BIGPOND?

BigPond is infamous for causing a ruckus in the industry a few years ago: by introducing bargain-basement \$29.95 broadband plans.

But those super-cheap deals have been wiped out with its new high-speed broadband service: pricing starts at \$59.95.

BigPond is still out there marketing its "half price for the first twelve months of a two-year contract" deal heavily though, which does bring the price back to \$29.97 — but bear in mind that only the first twelve months are cheap (you'll then be committed to a further 12 months at \$59.95).

The entry-level \$59.95 plan is also frighteningly bad value: it buys only 600MB of usage with BigPond, but other ADSL2+ providers offer much more: at least 7GB at ADSL2+ speeds on Optus Direct, at least 10GB on iiNet, 20GB on Internode and 30GB on TPG.

BigPond is also charging excess usage rates of \$150/GB on all plans except for its \$89.95 "Liberty" plan (12GB at full speed and then unlimited usage at dialup speeds

WHY TELSTRA'S ADSL2+ IS SO LIMITED

You may be wondering why a telco as big as Telstra only installs ADSL2+ in so few exchanges — 360 out of a total of about 5,000. It's because Telstra firmly believes it shouldn't be forced to offer wholesale access to any new broadband network it builds. It believes other ISPs should build their own networks.

The 360 exchanges in which it has activated ADSL2+ are ones that already have at least one competitor's ADSL2+ service available. It's probable that Telstra has legal advice that it doesn't need to provide wholesale access in places where there's already competitive infrastructure.

Rock star: when you charge as much as Telstra does, you can afford to hire rock stars to launch your broadband service. Not that we were complaining — we have never seen someone play the guitar as fast as Phil Emmanuel.



after that). Internode managing director Simon Hackett points out that it would be possible to run up an excess usage bill of a million dollars if you were to download flat chat for a month on one of Telstra's excess-charged broadband plans.

Telstra does now offer a plan for serious leechers with a 60GB allowance, but it's expensive at \$149.95. For \$119.95 you can get 80GB on Internode, while \$129.95 buys you at least 60GB on iiNet or 100GB with TPG.

To add further insult to injury, Telstra whacks another \$10 onto all the monthly plan fees unless you swing your home phone line completely over to Telstra, which might push your phone bill up if you have good call rates or capped deals with another carrier.

Telstra is also continuing its unpopular policy of metering internet traffic in both directions, (essentially a form of punishment for P2P users who transmit as much as they download). No other ISPs in Australia do this; Telstra is among just a handful in the world that do.

Despite all that, we're not saying "don't join BigPond" — we're just letting you know what the Telstra salesman probably won't go out of his way to highlight to you...

If you happen to be a huge AFL or V8 Supercars fan, and if you're absolutely thoroughly convinced that you're a Windows Media user through and through (and you'd never buy an iPod), then you might enjoy the pay-per-view BigPond Movies service and BigPond Music store, all with unmetered downloads. However,

MODEMS AIN'T MODEMS ANYMORE, SON

It used to be so simple: you could buy an ADSL modem and know that it would work with any ADSL provider. Not anymore.

There's ADSL1, ADSL2+ and ADSL2+ Annex M, all of which are different standards and, although they're backwards-compatible, they're certainly not forward-compatible.

To throw further confusion into the mix, different ISPs are using different brands of DSLAM, and a modem that gets smoking speeds on one brand of DSLAM may not fare so well with another brand.

BUYING A MODEM FOR ADSL2+ ANNEX M

Internode recommends the Billion 7404VGP-M (the previous 7402/7404 models do not support Annex M), or the Open Networks 624W (the plain 624 does not have support). Internode has also observed that the very latest firmware for the Linksys WAG54G supports Annex M.

Whirlpool.net.au users have also created a wiki noting some other Annex M-compatible modems: Billion 7300/7300G, Billion 7402R2-M, 7401VGP-M, 7404VGO-M, DrayTek 2800 series, Dynalink RTA1025W, RTA1320, RTA1335, Netcomm NB9W, Netgear DG834v3, DG834Gv3, DG834GV. The wiki on the topic is at <http://snipurl.com/12e35>.

BUYING A MODEM FOR TELSTRA ADSL2+

One of the unique aspects of Telstra's ADSL2+ network is that it is using Alcatel DSLAMs rather than the Ericsson DSLAMs used by Internode and iiNet or the Huawei DSLAMs used by Optus.

Many Australian models of modem have been fine-tuned to work best with Ericsson DSLAMs and nobody has yet released public test results of how different ADSL2+ modem models work with Alcatel DSLAMs in Telstra's network.

BigPond is supplying the ADSL2+-compatible Siemens Speedstream 4200TR, which achieved excellent results against Internode's Ericsson DSLAMs in our last round of modem testing in June 2006, and it's a certainty that it will also work well with Alcatel DSLAMs, given that it's Telstra's default modem.

Until we can test them, we can't say how well other modems will fare with Telstra's Alcatel-based ADSL2+. The problem is, you can't buy the Siemens modem via retail — it's only available through Telstra. BigPond is, however, selling the modems to customers who need them for \$138 (including delivery). Unfortunately, if you're an existing BigPond customer, this is your only option — the "free modem if you sign up for 24 month" deals are only available to totally new customers.

even BigPond appears to have conceded that most people don't care that much about unmetered content these days, and it has taken a leaf from Optus' marketing book, highlighting the encyclopaedia that is the internet as a great educational tool for kids.

ARE OTHER ISP OPTIONS AVAILABLE TO YOU?

Anywhere there is BigPond ADSL2+ available, there will be ADSL2+ available from another ISP, and virtually all ISPs will be reselling the 8Mbit/s service nationally. At the time of writing, most ISPs were still finalising their plans. Next month, we'll have the full table of plans, including 8Mbit/s ones — but in the meantime, you can check out www.broadbandchoice.com.au.

You may save a lot of money by considering all the deals rather than taking one of BigPond's heavily promoted offers, which often have attractive prices at first (and then get more expensive later on).

If you're shopping around for a new high-speed plan, make sure the very first question you ask a potential ISP is if you have to switch your phone service over to them as well — you might get stung with pricey line rental or you might lose big-telco benefits like capped calls to mobiles.

For example, iiNet forces customers to switch their phone line over (along with a jawdropping \$34.95 line rental) or, alternatively, take up a VoIP service (\$9.95/mth) on top of the ADSL2+ plan fee if they want to enjoy full ADSL2+ speeds. Telstra's basic line rental fee

HOW LONG WOULD IT TAKE TO DOWNLOAD...

TIMES IN HOURS: MINUTES	YE OLDE 256KBIT/S (APPROX 27KB/S*)	YE OLDE 512KBIT/S (APPROX 54KB/S*)	YE OLDE 1.5MBIT/S (APPROX 162KB/S*)	8MBIT/S (APPROX 864KB/S*)	20MBIT/S (APPROX 2,160KB/S*)
A 70MB MP3 rip of a CD	0:17	0:08	0:02	< 0:01	< 0:01
A 350MB TV episode	1:28	0:44	0:14	0:02	0:01
A 1GB movie	4:18	2:09	0:43	0:08	0:03
A 2GB Vista beta	8:37	4:18	1:26	0:16	0:06
A 4.2GB DVD rip	18:07	9:03	3:01	0:33	0:13

* Real-life throughput taking into account ADSL networking overheads which reduce speeds from theoretical maximums. Also, the above times assume that the server at the other end is able to pump the data out as quickly as you can receive it, which is likely only to happen with things that are locally cached at your ISP, like Microsoft Service Packs.

is only \$19.95, while Optus Direct's is \$19. Many ISPs, like Internode and TPG, don't require you to change phone carrier at all.

ADSL2+ "ANNEX M" DOUBLES UPLOAD SPEEDS TO 2MBIT/S

A new extension to the ADSL2+ standard, "Annex M", has been approved for use in Australia. It more than doubles upstream speeds on ADSL2+ connections to a practical maximum of about 2.5Mbit/s. In reality, most people will get somewhere between 1-2Mbit/s, with a lucky few getting 2-2.5Mbit/s.

Internode is the first ISP to release services with ADSL2+ Annex M enabled. In exchanges where it has its own ADSL2+ DSLAMs, customers who choose one of its SOHO or Business plans

can get the enhanced upstream speed. It doesn't plan to offer it to home users at this stage, though the new SOHO plans are well within reach of home users, starting from \$69.95 for 10GB.

iiNet is also considering ADSL2+ Annex M, but says it will be several months before it goes into trials, and it may limit its use to circumstances where the extra upstream speed is warranted (for example, customers who need multiple VoIP lines on one connection.)

BigPond says it has no plans to use Annex M. In fact, it is going the other way: although it offers unrestricted (up to 1Mbit/s) upstream speed on its ADSL2+ service, it has chopped the maximum upload speed of its

otherwise uncapped 8Mbit/s plans. Coincidentally, they're the ones that Telstra is wholesaling to other ISPs. They've been capped at 384Kbit/s: a bit better than the crap old 256Kbit/s, but not much. It's a shame, because it will hamper what could have been a great era of growth for high-quality video chat, home-to-office networking and so on. BigPond MD Justin Milne wouldn't tell APC why,

Is it a coincidence that Telstra's ADSL2+ modem looks like a stingray?

reiterating that it was the decision Telstra had made.

One possible reason? An 8/1Mbit/s service would probably be enough for most people; it could substantially reduce demand for ADSL2+ and make it more difficult for Telstra to bargain with the government over future broadband rollouts. Another possible reason? Giving people more than enough upstream bandwidth nationwide would be a huge free kick for adoption of VoIP services — and not so good for Telstra's landline revenues. **ETC**

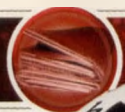


WE'RE NOT SAYING "DON'T JOIN BIGPOND"; WE'RE JUST LETTING YOU KNOW WHAT THE SALESMAN PROBABLY WON'T HIGHLIGHT

FIRST 8MBIT/S PLANS REVEALED

Now, even if you're not in an ADSL2+ coverage area, you can still get 8Mbit/s service through a number of ISPs. Here's the first batch of plans that were announced at press time.

ISP	EXTRA COSTS	PRICE	DOWNLOAD ALLOWANCE	EXCESS USAGE COST
BigPond	Phone pre-selected to Telstra (min. \$19.95 line rental)	\$59.95	600MB	\$150/GB
BigPond	Phone pre-selected to Telstra (min. \$19.95 line rental)	\$89.95	12GB	Free, but around dialup speed.
BigPond	Phone pre-selected to Telstra (min. \$19.95 line rental)	\$119.95	25GB	\$150/GB
BigPond	Phone pre-selected to Telstra (min. \$19.95 line rental)	\$149.95	60GB	\$150/GB
Internode	None	\$79.95	20GB	Free, but around dialup speed.
Internode	None	\$99.95	40GB	Free, but around dialup speed.
Internode	None	\$139.95	90GB	Free, but around dialup speed.
Cyberone	Phone pre-selected to Cyberone (min \$32.95 line rental)	\$64.95	600MB	\$140/GB
Cyberone	Phone pre-selected to Cyberone (min \$32.95 line rental)	\$89.95	15GB	Free, but around dialup speed.
Cyberone	Phone pre-selected to Cyberone (min \$32.95 line rental)	\$109.95	30GB	Free, but around dialup speed.
Cyberone	Phone pre-selected to Cyberone (min \$32.95 line rental)	\$129.95	60GB	Free, but around dialup speed.



ENCYCLOPAEDIA Britannica opens up

As Wikipedia's role is reassessed by users, Britannica lets in contributions. Tony Sarno reports.

It's the classic case of a business fighting back to stop being run over by internet upstarts: Encyclopedia Britannica has unveiled plans to counter the community-based free internet encyclopedia Wikipedia by letting users of the Britannica web site submit content and alterations to encyclopedia entries. Anyone can now submit material, just like on Wikipedia, but the difference is that it will go through professional fact-checkers and editors before it's accepted for publication online.

This goes straight to the heart of Wikipedia's greatest weakness: the ongoing failure of its review system to guarantee content is fact-checked and credible, and addresses the criticism that Britannica is not open to contributions from the public (and to alternative viewpoints). While Wikipedia remains free, Britannica will charge a subscription, believing users will pay for the value it provides.

Encyclopaedia Britannica Australia's executive director of consumer products, Roland Smith, says the changes introduced have opened the way for public contribution to the encyclopedia for the first time in its 248-year history. "If someone reads an article and disagrees with it, or would like more information on it, they can submit a comment or material, and the information goes to an editor who then looks at the info. If it adds to the online entry and it's accepted,

it gets passed on to a fact-checker and, if it is correct, it will be online within a week."

To make this turnaround time possible, Britannica has increased the number of editors and fact-checkers it employs. "Before, it used to take up to three months to publish changes to an entry; now we've gone from three months to a week or two," says Smith.

In another move designed to open up the encyclopedia and its processes to the community, Britannica has introduced blogs on its site where contributing editors can discuss their work.

For a while in the late '90s and early in this new century, Britannica was in trouble. In the rose-coloured glow that can sometimes greet sexy new technologies, Wikipedia was seen as an exciting alternative to its dead-tree rival: its facts taken at face value and its amazing breadth of content seen as a reflection of a new information egalitarianism where anyone could submit material and not be filtered by an editor.

The obituaries were being written for traditional, "elitist" sources of information (as the Wikipedia founders were fond of describing publications such as Britannica). Astonishingly, Britannica had been around since 1768, when it was first published in Edinburgh, Scotland. It was first sold in Australia in the 1800s and over the years its contributors had included notables ranging from Einstein and Freud,

Wikipedia may house millions of entries, but just how reliable are they at the moment?

Marie Curie to Milton Friedman, Isaac Asimov and Carl Sagan. But now, its very existence was being threatened by internet nerds who'd created a publishing platform where anyone could contribute.

As users rushed to the internet, sales of Britannica's print encyclopedias declined dramatically. But recently, something unexpected happened. Smith says sales of the print-based Britannica stopped falling — and even rose slightly. Sales of the disc-based Britannica (the full text of the Britannica print version and more) grew healthier and traffic to www.britannica.com boomed. Meanwhile, Wikipedia's honeymoon was coming to an end as people started questioning the integrity of some of its content.

Britannica's marketing line in the face of the internet onslaught had always been that its information could be trusted, but now the public was finally becoming more receptive. When several Wikipedia entries were exposed as wrong or misleading, it highlighted Wikipedia's main flaw: its very open, community-based nature could not guarantee the veracity of its entries, and, worse, its system did not make contributors accountable for what appeared on it. Its review process also led to turf wars between contributors over ownership of the entries and the facts in them.

Far from putting Britannica out of business, the shortcomings of community-based information on the net highlighted the need for fact-checked information of the kind found in professional publications, where experts are paid for the content and are accountable for it.

Britannica markets its editorial process as its key differentiator. Smith says: "The process starts with a commission from a scholar or expert who submits it electronically to our editorial workflow system. It then goes to the commissioning editor, who will read it and decide what the next step is. Here it may take different paths, depending on the nature of the article and the editor's judgment. Sometimes articles are sent out for review by our advisers, though increasingly we are editing and publishing submissions online faster than ever before. All articles are fact-checked.

"We achieve balance and objectivity by consulting scholars

from around the world, using contributors who are familiar with all the issues and controversies in their fields, and having skilled editors who know whom to consult and how to exercise judgment to get things right. There's no simple formula. You have to have smart, skilled and experienced people and work hard at it."

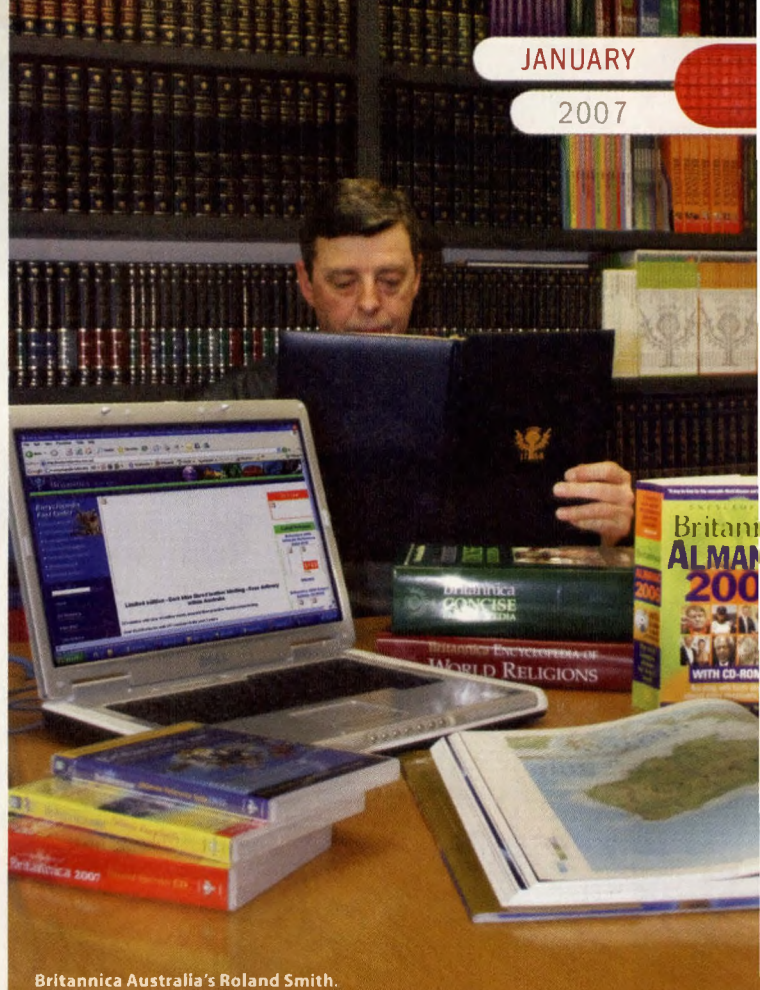
Britannica is banking on many users being willing to pay for its service of fact-checked and edited information. Subscription to its web site is \$69.95 a year. The advantage of the site is that it's updated around the clock. The DVD/CD version of the encyclopedia (\$129) is best if a user is looking for a combination of the entire text of the 32-volume print encyclopedia (now sold primarily to schools and libraries) and extra multimedia functionality that's not practical on the web. There are also student encyclopedias, including the Junior, for primary kids, and Middle School, for high-schoolers, available in print and DVD/CD.

Britannica has just released the 2007 Encyclopedia on DVD/CD. This includes better search facilities, all 12 years of Britannica Book of the Year results (more coverage of current events and people), a new cleaner design and a sticky note feature that allows users to annotate any article and print out the notes. Timelines have improved interfaces and the dictionary is now available in a separate window (and can open from the system tray).

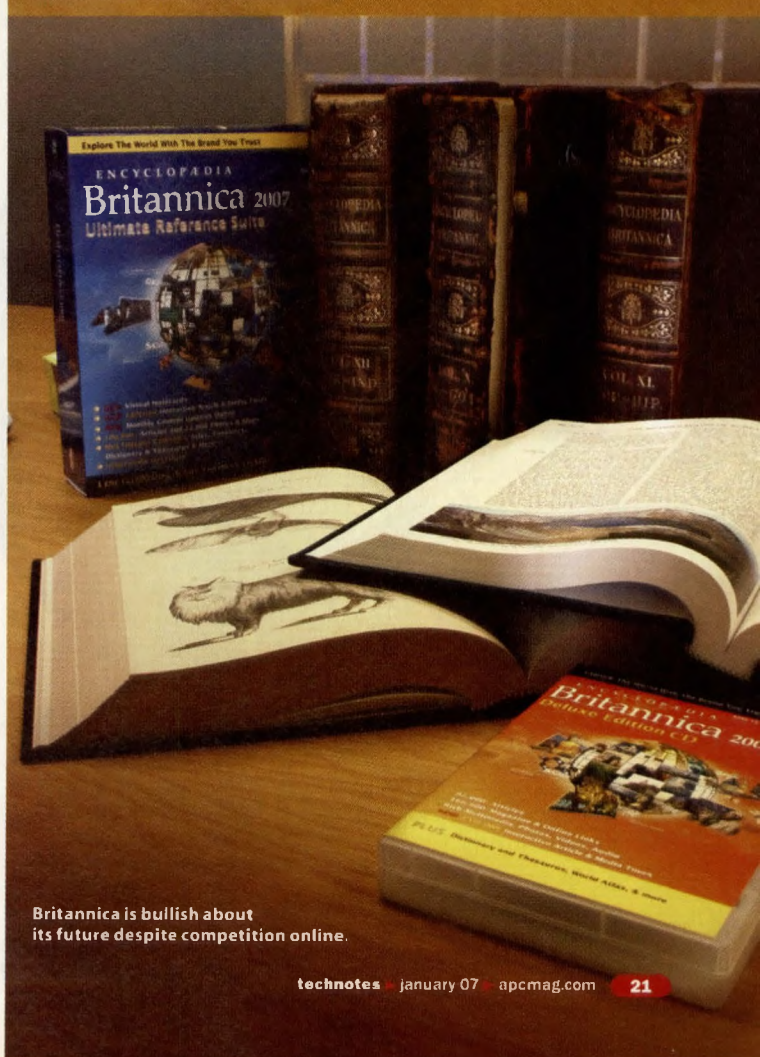
Britannica is also about to release the 32-volume 2007 print version, as well as the 26-volume Compton's by Britannica and the all-new 2007 Britannica Student Encyclopedia.

Not surprisingly, Britannica's bullish about its future in a world where the barriers to publishing have been removed and anyone can be an information publisher. Smith says: "We published what was probably the first digital encyclopedia in 1981; we invented the multimedia encyclopedia in 1989; and we put the first encyclopedia on the internet in 1994. Today we publish on the iPod, on mobile phones and on a variety of wireless and handheld devices."

The difference to competitors is that "[At Britannica] we position ourselves as the most reliable and authoritative encyclopedia in the English language." **BTTC**



Britannica Australia's Roland Smith.

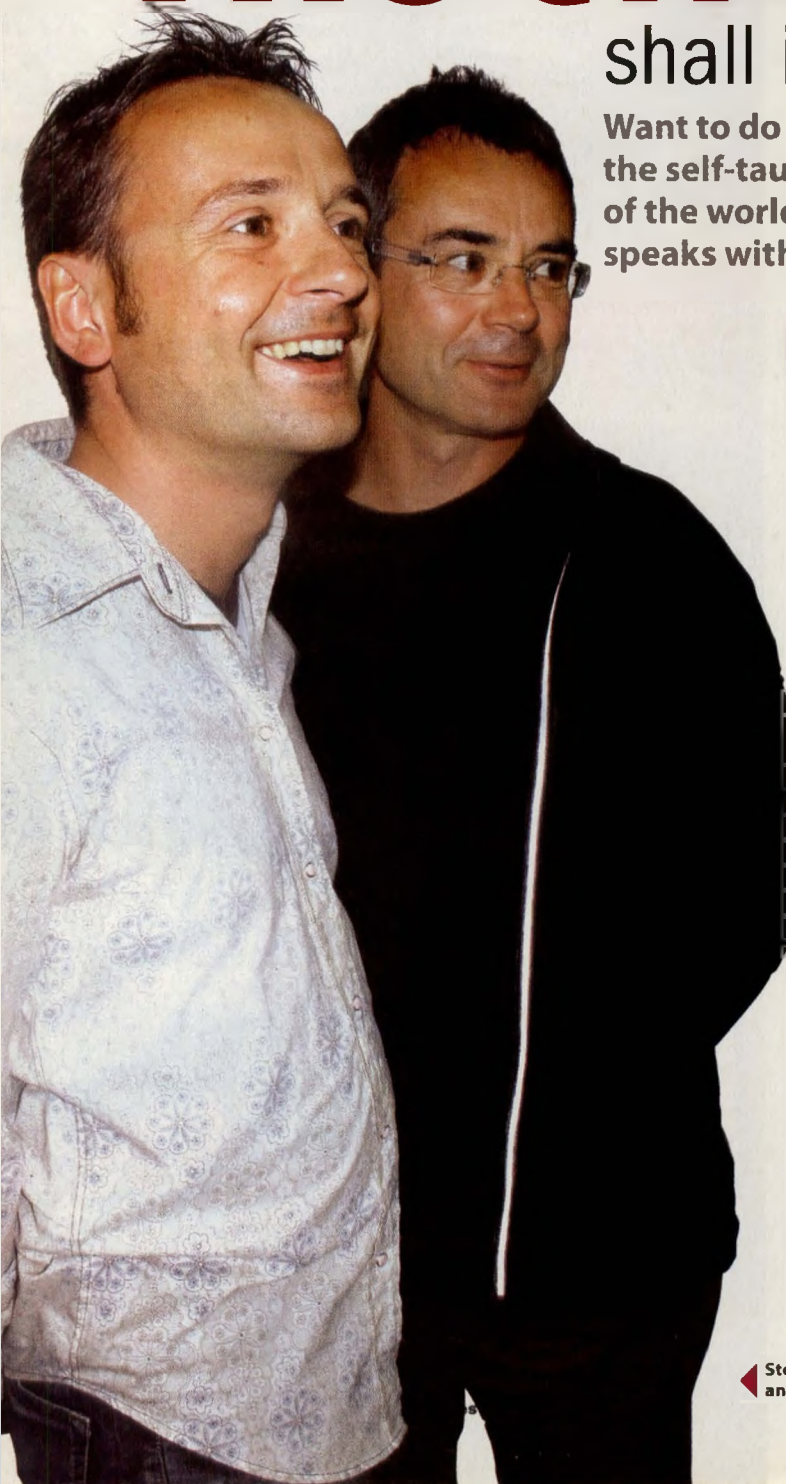


Britannica is bullish about its future despite competition online.

THE creators The tweakers

shall inherit the Earth

Want to do Windows your way? Stefan Kuske, the self-taught programmer who wrote some of the world's most popular tweaking software, speaks with *David Flynn*.



If you've ever trawled the web for Windows-tweaking software, you'd have come across Tweak-XP, the web's unofficial desktop customiser. Created by German programmer Stefan Kuske, it made its name as the Windows add-on we all wished XP featured.

Kuske is a regular visitor to Australia, as much for attending Melbourne's F1 championship as for catching up with brother and business partner Reiner across the pond in New Zealand. When APC sat down with the pair, they'd only just finished the first release of Tweak VI, the Vista-tweaking tool which succeeds the best-selling Tweak-XP. It was the end of many long months that Kuske had spent poking around under the hood of Microsoft's mammoth OS to discover and unlock its secrets.

"It's all just trial and error, and being very curious about how things work," he says. "A good example is the Vista sidebar. I look at what it does and if there are any public switches which influence its behaviour. Then I start to think about what *could* be changed, or what Microsoft might want to hide from the user."

While changing settings at the UI level, Stefan uses software which he wrote himself to monitor what's happening under the surface — especially when it comes to monitoring the activity of "handlers"

attached to each window.

"A handler is like the number of a house," explains Kuske. "Even if all the houses looked the same, just like all windows might look similar, you need something that specifically identifies every house or window and separates it from the other ones. In Windows this is the handler and, once you know which handler a window uses, you can directly access all its settings. So once I know the handler for the Sidebar window in Vista, I can make programming calls to the sidebar directly, without even going through the Registry."

"Microsoft doesn't provide all the details about Windows, so you have to find them out for yourself, and that takes a long time and requires lots of testing," Kuske stresses. "I use MSND a lot of the time to find specific information on certain parts of Windows. I also search the programmers' newsgroups and use Google quite a lot. Whatever you're looking for, sooner or later you'll find it, but sometimes it takes a *lot* of time and there's still a *lot* of work afterwards."

Typical of this was the need for Tweak VI to bypass Vista's User Account Protection, which requires user approval almost every time that a program needs system-level access. For tweaking tools which serve up hundreds of settings as simple tick-a-box options, UAP is not so much a speed bump as a 10-metre-high wall.

Stefan Kuske (left) with his brother and business partner, Reiner.

Tweak VI — soon to be customising Vista desktops the world over.

"I eventually found a very long article on MSDN on how UAP works and how to program your software to not conflict with it. This had some hints on using manifest files, which are used in Windows XP to make Visual Basic programs look like pure Windows XP applications. If you have a manifest file located in the application folder, the program behaves absolutely differently. That was similar with user account protection: the programmer has to set up a specific manifest.xml file and embed that into the executable.

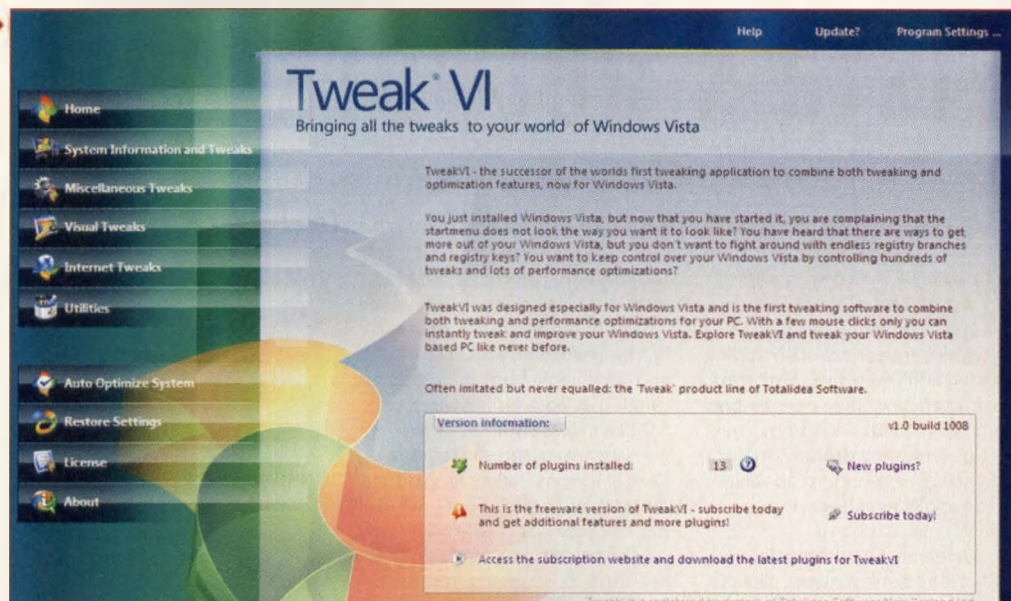
"Unfortunately, I use Visual Basic 6, which can't embed a manifest into an EXE, so I had to find a way around this. I tried a program called Resource Hacker, which can be used to change icons and texts and whatever you want in a program. I used Resource Hacker to get the manifest.xml file into the executable, and when Vista finds that information it allows Tweak VI to run with administration rights."

What APC found most impressive about all this is that Stefan Kuske has no formal training in computer programming. A qualified dental technician, he was also studying philosophy, religion and the history of art at university — and programming in his spare time. "I was always curious about how things work and how to make a machine do what I wanted it to do".

His brother Reiner recalls when Stefan was nine, "he managed to program the night sky on the screen of his little computer" (which Stefan fondly remembers as a Texas Instruments 99/4A with a 3.3MHz processor). "I didn't know what the attraction was, and I still don't know!"

Stefan's first program was CheatRobot, written in the mid-1990s for the popular games Creatures and Creatures 2 (and offered up as freeware).

"Then I read an article on



I WAS ALWAYS CURIOUS ABOUT HOW THINGS WORK, AND HOW TO MAKE A MACHINE DO WHAT I WANTED IT TO DO

Windows memory optimisation and saw a shareware memory booster, and I thought I could do better in how it managed memory and also in the interface".

This became the original commercial program RAMbooster, which soon found its way into an enhanced suite of utilities for Windows 9x and Me. Tweak-Me, the first in a best-selling line of Windows-tweaking power tools, was born.

Tweak-XP soon followed and was launched to new heights of success when the shareware version was included on a CD bundled with the Windows XP Toolkit book published by Microsoft Press. "We did have a few customers at Microsoft", Stefan notes, but he says that Microsoft never approached them to buy it.

By 2003, Tweak-XP had become so popular that Stefan found filling

orders and providing technical support was a full-time job in itself. Reiner, who had moved with his wife from their home town near Dusseldorf to the North Island of New Zealand, took over the customer service role to allow Stefan to concentrate on programming — an arrangement holding to this day.

Kuske writes his Tweak software, along with companion utilities such as the free Firefox optimisation tool FireTune, in Visual Basic 6 — a programming language that's almost a decade old.

He's opted not to upgrade to the Visual Basic .NET line because of the work involved in rewriting all his code, much of which is shared and reused between programs. He also recommends VB to anyone learning programming.

"Start with a very simple

programming language. Go and get Visual Basic. Some people say 'Don't start with VB' or 'Don't get stuck with VB'; but that is absolutely wrong in my point of view. You can do almost everything in VB if you know how to do it. It might be easier in C or C# for example, but I'm pretty sure that you're a better programmer if you can do things in VB that might be easier in another language."

Above all, however, Kuske stresses the importance of putting passion into one's programming. "You have to have that interest. I have a *real* interest in how things work and how to make a machine do what I want it to do. The funny thing is that the whole computer is based on zeroes and ones. It's amazing to see what you can achieve just by turning a switch on or off!" **END**

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Vista's network cost

The networking features in Vista are impressive — but ensure that the new operating system is much chattier than XP (giving admins much to keep an eye on).

Windows Vista comes with some very nice networking features — a completely new Network Centre, network mapping, Sharing and Discovery, UPnP Media Sharing and excellent peer-to-peer connectivity. But these brand-new features rely very strongly on Vista's beefed-up networking capabilities at the application layer, and this always comes at a cost.

By default, Vista comes loaded with all the same network clients, services and protocols as Windows XP (Microsoft Client, File and Print Sharing, QoS and TCP/IPv4), but it has three additional protocols — TCP/IPv6, Link-Layer Topology Discovery Mapper and Discovery Responder. The last two protocols are linked to the Link-Layer Topology Discovery Mapper service, which is what allows a Vista-based machine to create and maintain the Network Map.

Recently I set up a test environment to test network connectivity between two XP machines in a closed network, and compared that with two Vista machines in the same network, using Ethereal to capture the packets. The test proved two things conclusively — first, a default Vista install generates at least three times the network traffic of a default XP installation; and second, even with

the additional protocols disabled, Vista is still twice as talkative as XP.

In a home environment, this is hardly likely to be a problem. By and large, most home networks are running at least 100MB wired or 54MB wireless Ethernet, with perhaps two or three machines. Even at its most talkative, Vista isn't going to bring such a network to a halt or cause noticeable slowdown.

The situation changes, however, in a larger business environment. Network traffic tends to increase exponentially as you add more and more units, as each workstation attempts to sort out its own place on the network as well as every other machine in the local vicinity. And Vista does this more so than any other build of Windows to date.

The impact of this on many networks will be felt instantly. Increased network traffic results in a general slowdown of particular services, especially UDP-reliant services which don't have error control in-built. Network browsing, although enhanced in Vista, will also be slower. The true impact will depend very much on the network setup. More advanced networks have back-end technologies in place which minimise the effect of an increase in local traffic or general, non-directional broadcasting, such as broadcast limits at the switch level, intelligent subnetting and VLANs. These



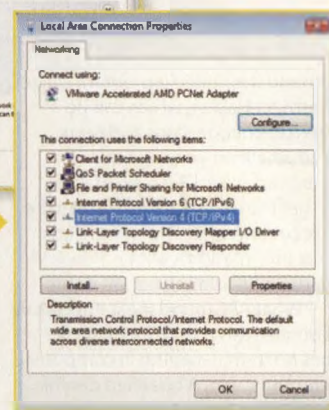
Behind the scenes, Vista has more protocols installed by default.

networks won't be affected too badly by the introduction of chatty Vista workstations. Smaller networks, however, tend to be a bit more open and they will definitely feel the impact.

So the task of combating this potential problem is going to fall to the network admins, who need to ensure that their networks are ready to deal with the inevitable increase, and also to the desktop admins, who need to ensure that the Vista deployments are customised to fit the needs of the business — without leaving unnecessary and problematic services in place.

It's a situation which seems to be a trend with Microsoft products. The user base is massive, and any

The Network Centre is the hub of Vista's networking capabilities.



one product can't be everything to everyone, especially in its default configuration. So, the onus falls back onto expert users to mould the product to suit their needs and their users' needs. Fortunately Windows Vista, like pretty much every other Windows version, is incredibly customisable and easy to manage, and Microsoft have done an even better job of making Vista the most accessible, configurable and customisable iteration of Windows yet. www.pcworld.com



SO, THE ONUS FALLS BACK ONTO EXPERT USERS TO MOULD THE PRODUCT TO SUIT THEIR NEEDS AND THEIR USERS' NEEDS



HastalaVista

by

James Bannan

James Bannan is a systems manager at St Leonard's College (Vic) and APC's resident Windows expert. He'll be checking out Vista for you every month.

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Linux != games?

Traditionally, Linux is not the gamer's choice of OS. However, all that could soon be changing in the console market...

Gaming under Linux is a misnomer, right? At least, it's always been this way. That Windows is the gaming platform of choice for PCs started as nothing more than ubiquity, until Microsoft invested heavily with the development of DirectX. And it's just as well it did, as this enabled a far more advanced development pace for gaming on the PC that, it's fair to say, galvanised what is now an industry much bigger than Hollywood.

Linux has never really had a focus on games. It's the one market Linux hasn't been able to penetrate. Servers, desktops, embedded, scientific, education, space race (and everything in between), but not games. There's been many attempts to try, though — from Loki Games, which sourced Windows game licences and made native, commercial, Linux ports, to Gentoo's gaming Live CD, perhaps the first to integrate OS and games into a bootable disk for the PC, to Transgaming's enhancement of Wine in Cedega to play Windows games on the Linux desktop. I'd love to say they've all been successful in their own way, except they haven't. Loki closed its doors in 2002 — Linux users either weren't gamers, or didn't want to pay for games. Gentoo's CD, while

more of a "just because we could", made the news briefly and then was forgotten. And Transgaming's Cedega (by far the most successful implementation of bringing gaming to Linux) does work well — but it's for Windows titles, not Linux ones.

I'd say Linux has missed the boat for being a gaming platform, even with the handful of native titles supplied by developer luminaries like id and Epic, because the momentum of Windows and DirectX has ensured that if game developers want to sell their

encouragement of Linux-based development on the PS2 (and that it has confirmed it will ship a Linux desktop on the PS3 as an option), the company clearly has experience developing with it. Sony has been as tight-lipped as a press-release written in liquid paper over this, however, so we're not going to find out just how deep the penguin hole goes until hackers start taking to it with zest and screwdrivers.

To a lesser degree, as there's been no remotely formal confirmation, Nintendo's Wii is also

rumoured to run off a Linux base. But even if this turns out to be the case, it doesn't mean a new dawn for Linux gaming — as it's more likely a base for a proprietary layer that won't be open to anyone not paying gigantic fees for games development. Still, you can taste the irony that, after all these years of being the gaming underdog on the PC, Linux might help power the next generation of consoles against Microsoft's very own Windows-based Xbox.

And, if nothing else, it's nice to dream isn't it? **APC**



GAMES. THE ONE MARKET LINUX HASN'T BEEN ABLE TO PENETRATE — SERVERS AND DESKTOPS MAYBE, BUT NOT GAMES

games, there's only one platform to develop for.

But as we race to the onsale of Sony's PS3 and Nintendo's Wii, there's an odd and perverse twist in the tale. According to Terrasoft, who have been working with Sony on the development of Yellow Dog Linux for the PS3, Sony's next-gen console has been "designed for Linux". While this doesn't mean it actually runs the operating system, it does at least show that a Power-based distribution can run with ease on the hardware, and if Sony were to go with an alternative operating system to power its console — and let's face it, you don't want your Xbox-killer to run an OS controlled by Microsoft — Linux would be a natural choice. Plus, given Sony's past



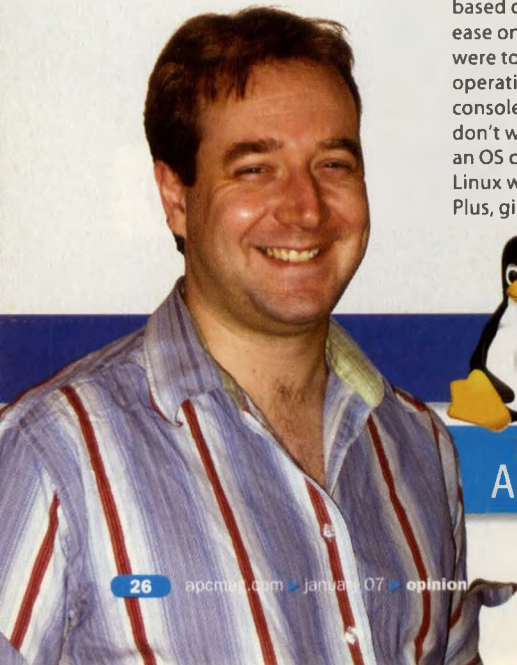
Tux, is that you? Nintendo's Wii is rumoured to run off a Linux base.



LinuxWindow

by
Ashton Mills

Editor of the Linux Pocketbooks series, and more recently Atomic magazine, Ashton has been a tech journo for over 12 years, including five years with APC.





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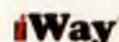
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Problem in chair, not in computer

Techies continue to have fun at the users' expense, but, frankly, who can blame them? Take a look at this amazing collection of some of the dumbest end users of all time.

Gerry Kounadis, technical specialist from West Footscray, Melbourne, recalls a user who couldn't quite get her password right. "She couldn't get into a particular app because her Caps Lock key was on and therefore she was typing the wrong password. The sys admin that helped her solve the problem filled in the resolution description as 'picnic' (Problem In Chair, Not In Computer). What he didn't realise was that the resolution description gets emailed to the user when the call is closed. The user logged another call demanding to know what 'picnic' was. We quickly called her up and told her that it stood for 'Problem In Citrix, Not In Computer' and that because we had so many calls to go through, we used these (and other acronyms) in our close descriptions to save time. Luckily for him, she bought it."

THE PASSWORD TEST

The continuing saga of password problems regaled here in End User reminded reader Tony Juratowich of a tale of woe involving a council worker. "After he had been given a user profile on a network, he complained that he could not log in. Upon questioning, he revealed the computer kept telling him his



"Uh, yeah, hi... Uh, my screen has just gone black. I can't see a thing here."

password was incorrect. After further prompting, he innocently stated 'I am entering the password just like you and everybody else does - I type in five stars!' After the howls of laughter from nearby workmates had subsided, I gently explained all about the stars. Thankfully, he mastered that concept and did not have any problems after that." Amen.

THE SCREENSAVER TEST

Paul Ellan, from Rasmussen, Queensland, worked for a large government organisation as a technician. He oversaw several control rooms throughout Queensland and points out that the clerks that manned these control rooms could easily earn twice what

a technician could. But this didn't make them twice as bright: "One of our techs got called out to replace a broken computer. The customer complained the computer was dead and the screen was blank, and as usual it was a major catastrophe that required immediate attention. When our technician arrived, the control clerk complained that the tech had not responded to the call quickly enough. The controller explained he had been sitting there at his control desk when suddenly the screen went black (and that the world would end if the tech could not repair or replace the computer). The tech then used his index finger to give the mouse a gentle nudge and the screen suddenly burst back into life. As the tech walked out he

said, 'That's what's called a screen saver, and thanks for the 4.5 hours of pay for the callout, mate!'"

ULTIMATE, BEYOND-THE-PALE DUMB

Hayden Madigan, from Port Pirie, South Australia, was IT manager at a number of hospitals. One user rang to tell him her computer at the hospital wasn't working. "I asked her if it was turned on and she said, 'yes'. I asked what colour the light was on the monitor. She said amber. I asked her the colour of the lights on the desktop. She said she didn't have a desktop, she had a laptop. I asked her to open the lid on the laptop and tell me if there were any lights on the laptop. She said she'd left the laptop at home, but she had the monitor, keyboard and the mouse here. When I explained that she needed the laptop to make it all work, she said, 'Why? It doesn't do anything; it just sits there.' I hung up the phone and screamed." We admire his restraint.

LIGHTS ON, NO-ONE @ HOME

Chris Hill was doing phone tech support when he landed a total email novice. "He said he could receive emails but not send them. I went through all his settings with him twice to make sure things were set correctly. This was very frustrating, as I could send him an email and he would receive it. I then found out he could "reply" to an email. So I tried to get the user to send me an email. After a drawn-out process I asked the user to read



EndUser

from
The readers of APC

APC readers who deal with new computer users or incompetent IT administrators share their survival stories.



Stop now, please: one reader fails the password test...



It looks pretty simple, but the humble mouse baffles many an end user...

AFTER THE HOWLS OF LAUGHTER FROM NEARBY WORKMATES HAD SUBSIDED, I GENTLY EXPLAINED ALL ABOUT THE STARS

out every key he hit while entering in my email address. As he did, I managed to hear one more key entered than the letters he was reading. I asked him to repeat the process. I stopped him at the @. He was actually typing "at", not @. 'Well nobody told me,' he said.

THE MOUSE TEST 1

Reader Evan Stubbs was running a training course on basic Windows usage. We're talking *basic* here: people who had never used a mouse. "One of the women was very nervous about even touching the mouse. Eventually, I got her to try moving it left and right and showed her how the icon on the screen moved as she moved the mouse. I turned around to help

some of the other people with various right-mouse-button difficulties. When I turned back, she was on her knees, desperately trying to see the screen from under the desk: she had rolled the mouse off the edge of the desk and started rolling it down the side of the desk. She was trying to do the right thing, and didn't realise that she could lift the mouse off the desk."

THE MOUSE TEST 2

Andrew Morrison, from Melbourne, remembers a colleague attending an "Introduction to Computers" course some years ago: "The topic under discussion at one point was how to get around in Windows using the mouse and the keyboard. The instructor said that the mouse

was used to move the cursor around the screen in order to do things on the desktop. She then asked the class to use the mouse and practise moving the cursor around the desktop. The gentleman sitting next to my colleague picked up the mouse, placed it over the screen and attempted to move the mouse around the desktop. The instructor thanked him for expanding her range of IT anecdotes!"

THE MOUSE TEST 3

Mark Murden from Harbord, NSW, runs a small system admin company. "One particular client I had not spoken to in a while (after purchasing and setting up a basic business laptop) called me out of the blue. He was using an external

USB mouse and complained that the 'mouse pointer thingy' was stuck in the top-left corner of the screen." When none of Murden's remote troubleshooting seemed to work, he decided to visit the user to see the problem for himself. "I turned up the next day with a new mouse in hand and asked for a demonstration of the problem, which became quite clear before I even reached the desk. The mouse was back-to-front with the cable running back towards him and the buttons under the heel of the palm, the result being that moving the mouse down and right would move the pointer the exact opposite direction. Diplomacy has never been my strong point, so, resisting a chuckle, I turned the mouse round and walked out without saying a word. Obviously I should have said something memorable, since about six months later I got another call: 'How did we fix that mouse thingy getting stuck again?'" 

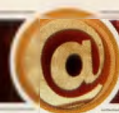
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This month's published readers win a Microsoft Wireless Laser Mouse 6000 worth \$129.95. Made for desktop PCs, it features Microsoft's high-definition laser technology with ultimate precision and smoother tracking and responsiveness (even on unique surfaces). This mouse includes a new magnifier tool and a tilt wheel, making navigating, viewing and editing easier. The Microsoft Wireless Laser Mouse 6000 delivers comfort and superior control to the desktop in a high-end style that will turn heads.



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Watchdog

eyes on vendors



An Apple a day. . .

...keeps the doctor away? Not so for reader **Nelson Lau**, whose ailing PowerBook was always on the mend. Watchdog examines the patient.

To cut a long story short, in the nine months that I have had my PowerBook, I have had the logic board, hard drive, two sticks of RAM, the keyboard, trackpad and clicker replaced as a result of faulty parts. And now, to put the icing on the cake, my battery has been recalled, which means that the only part of my PowerBook that remains from the original machine I bought is basically the LCD screen and the DVD drive.

I am sure you would agree with me that this is an unacceptable situation, given that I had spent \$3,500 on a brand-new machine and am now left with a bastardised mish-mash of component parts. What is worse (than the fact that my Apple has been a complete lemon), is that it has cost me literally many hundreds of wasted hours since I purchased the machine, with time spent on returning the unit on multiple occasions to the Apple Store, frequent extended phone calls to the AppleCare support line,

reconfiguring my entire computer after multiple recurring major crashes (resulting in significant loss of data), loss of productivity as a result of not having the laptop to complete work projects, loss of efficiency with working on a faulty machine which performed slower than the iBook G3 from which I had upgraded (and not to mention the time spent on writing long letters of complaint such as this one).

As a long-time, loyal customer of Apple, my level of faith in this company has been irreparably damaged by the incompetency and the lack of customer support that I have received. A close friend of mine who was the director for technical services and retail sales and marketing for Apple Australia in the mid-1980s was flabbergasted at the treatment that I had received and assured me that the problem would not have escalated to such a ridiculous level back in the '80s (when they achieved customer service satisfaction levels of over 95%). I certainly hope this declining

trend in the company is not going to continue.

Under the Trade Practices Act, a consumer is entitled to claim damages for a breach of implied warranties that goods are of merchantable quality and fit for their purpose. Clearly, my PowerBook has not been so.

Nelson Lau
Terrigal, NSW

Watchdog contacted Apple and invited the company to investigate and resolve Nelson's PowerBook issues. Public relations manager Fiona Martin replied, telling us the matter had been directly resolved with the customer. Nelson confirmed this: "I was wondering when you forwarded the complaint to them, as I received a call from Apple on Monday. I was contacted by the executive relations manager of Apple, who was very helpful and sympathetic and took the time to listen to my concerns. After our initial conversation, he went back to investigate the case further and decided that it would be in both our

interests to resolve the issue by replacing my faulty PowerBook with a new one (which I should be receiving soon), so we've reached a mutually agreeable solution to this ongoing problem and I can finally put the saga behind me!" Watchdog approached Apple again, to ask specifically why Nelson's PowerBook contained so many faulty components — and were other users likely to be affected by these problems?

Dear Watchdog,
This was an isolated incident and has been quickly resolved with the customer directly. If a customer has a concern with any Apple equipment, we would suggest that they log on to the support site on the Apple web site or contact Apple on 13 36 22 — or go to their local Apple Service Provider.

Fiona Martin
Public Relations Manager

Nelson got back to Watchdog, telling us his new model was a 15.4in MacBook Pro 2.0GHz (with an included USB modem). "I picked up the machine yesterday and it seems to be in perfect working order. I am happy that I can now finally place my trust again in the machine for my work."



I SPENT \$3,500 ON A BRAND-NEW MACHINE AND AM NOW LEFT WITH A BASTARDISED MISH-MASH OF COMPONENT PARTS

MISSING: ONE REFUND, SEVEN MONTHS OLD

Arnold Seglenieks of Berri, South Australia, purchased a Norton AntiVirus 10-user pack to gradually upgrade the variety of antivirus programs on computers throughout his organisation. However, despite proclaiming a range of expiry dates, the programs all adopted the expiry date of the first app installed, significantly reducing the length of coverage provided. Symantec support advised there was no way to fix this issue apart from immediate synchronous installation on all PCs (not possible in Arnold's situation). Arnold opted instead for a refund, but three months after returning the software and having not received his refund (or communications of any type) from Symantec, he was at a loss.

Watchdog invited Symantec to look into Arnold's problem. A Symantec spokesperson told us the company "would like to apologise sincerely for any delays or inconvenience Mr Seglenieks faced when dealing with our customer service team, and thank him for his patience in this matter. Symantec has been in touch with Mr Seglenieks and has since resolved his issue. Symantec is committed to providing customers with high-quality products and services and the best possible support for those, such as our free online support site which includes email, chat and telephone support. Symantec is constantly monitoring its service and support operations and takes steps to correct the situation

whenever delays occur."

Arnold did eventually receive his refund — a little over seven months after the software had been returned: "There has never been any apology from Symantec, nor a satisfactory explanation for such a delay, and I am quite convinced that if APC Magazine staff had not been involved, the refund would probably never have been paid. It will probably be difficult, but I intend not to purchase any further products from Symantec... fortunately there are better and more efficient products than Norton AntiVirus!"



A QUESTION OF POLICY

Having wrung my hands for a few weeks deciding whether I could really justify spending \$130 on a Logitech Laser G7 mouse, I purchased one and was delighted with the performance. However, when the battery pack ran out, I discovered one would only charge to around 80% (and the other to 20%). I returned the mouse to ARC Computers in Chatswood, expecting a replacement. ARC informed me that it is Logitech policy not to issue replacements or refunds unless they check the mouse. After two more weeks of waiting, I returned to ARC and demanded something be done, as the mouse was still not back from Logitech. The shop gave me a new G7, but not very willingly.

**Donald Clark
Hornsby, NSW**

Watchdog contacted Logitech and invited the company to respond to Donald's account. Line Andersen, marketing manager for Logitech Australia, had this to say:

Dear Watchdog,

All Logitech products are covered by an exchange warranty. It is up to each individual retailer, and

their distributor, whether they choose to exchange a faulty product on the spot, or they may wait for the warranty claim to be approved by their particular distributor. Individual warranty claims are *never* sent direct to Logitech for approval. Rather, they go to our distributors who issue return authorisation numbers to the retailers. When received by the distributor, all faulty products are professionally destroyed.

So, while we understand Mr Clark's frustration, Logitech's involvement in this particular issue is not what was causing the hold-up. Rather, it appears that this is due to the trading terms between ARC and their particular distributor. If ARC did indeed tell Mr. Clark it is "Logitech policy" not to exchange faulty products until tested, then the person with whom Mr Clark was dealing was misinformed.

**Line Andersen
Marketing Manager
Logitech Australia**

Watchdog approached ARC Computers to get the retailer's side of the story. Michael Deng of the ARC Group replied to us with

the following explanation for what Donald experienced:

Dear Watchdog,

While this is a major mix-up, most IT products do actually offer such warranty policies — Logitech is one of the rare exceptions. This case was the result of some of our staff members perhaps not fully understanding the terms of Logitech's warranty policy. We shall work more closely with both

Logitech and our distributors to ensure better customer satisfaction. We are in the process of establishing a set of rules for Logitech returns across all ARC stores. We are very sorry for what Mr Clark has experienced and hope we can provide better service from here on. If there are any other customers that we can help in the meantime, they should feel free to contact us via email or can phone our head office located in Silverwater.

**Michael Deng
ARC Group**



watchdog@acpmagazines.com.au

Has an IT vendor or telco stuffed you around? Let us know about it and we will chase them for a solution on your behalf. Letters sent to watchdog@acpmagazines.com.au must include the writer's full name, suburb, state and phone number to be considered for print publication and please also include details such as invoice numbers and people you've spoken to. Phone details will not be published. All correspondence becomes the property of APC and is subject to editing.



Epinions

have your say!



APC reader Jason Kovacs at work in PNG with local counterpart, Llane Munau — note the APC mags in the background! And above, Jason at the end of the Kokoda Trail with local guides.

ALL FOR A GOOD CAUSE

I'm writing to let you know what a great help your magazine has been to me (and others) over the past couple of years. I have just returned to Australia after working as a volunteer with the PNG Institute of Medical Research in Papua New Guinea. The Institute is an autonomous research arm of the PNG Health Department and is tasked with finding health solutions to address the tens of thousands of deaths from preventable causes suffered in the country each year.

I was given the job of setting up a multimedia unit to distribute everything from posters to DVDs, in order to help spread vital health and safety information. We worked at the HQ in the middle of the remote highlands, and internet access was intermittent and expensive — plus, top-of-the-line software was frequently out of our budget.

However, a subscription to APC wasn't, and its DVD of software that came promptly each month allowed us to (with a little inventiveness) fulfill all the media needs of the Institute. When I left, we had just completed a series of education films — films that had been edited, mixed,

titled and produced with software from APC DVDs. In short, I wouldn't have been able to do it without APC — so thanks, guys.

Jason Kovacs
Fitzroy, Vic

NO-NAME GOODNESS

Edward Mallett's letter about his son chewing up memory keys (APC September 2006, page 32) reminded me of an incident with my trusty old 64MB USB flash drive: a cheap, no-name device I bought nearly five years ago. It has been dropped countless times, but still functions without any problems. One day I accidentally left it in my pocket and threw my pants into our family's laundry basket. The next afternoon, to my horror, I found it sitting on top of the washing machine — it had been through the wash. Panicking, I plugged it into my computer, thinking all my homework was lost. However, all the data was readable, even though the drive had been in two different laundry solutions for over twelve hours. I even ran ScanDisk and found no bad sectors. Amazingly, my drive had survived the ordeal. Just goes to show: not all no-name hardware is of dodgy quality!

George Ye
Rockdale, NSW



METAPHORS AHOY!

Mark Cavanaugh (APC October 2006, page 28) is missing the point. His analogy (a Hyundai with Audi airbags) is wrong. Cars have optional extras. Applications are OS (ie. car) extras. Windows is like buying a car and getting all the extras (eg. GPS etc.) you don't want. GPS is unlikely to ruin your car, but programs *can* ruin your computer. Let's say you purchase a car, intending to put in a big stereo. It arrives with an (optional) stereo system you never asked for. Your mechanic says he can put yours in, but the original can't be removed. Mr Cavanaugh may be of the view that this is the price you pay for getting your car modified, but the fact is the stereo was not ordered and not desired. Microsoft does not allow users to hand-pick the applications installed on their systems. And let's face it, once Windows installs something,

letter of the month

THE COST OF CUTTING THE PRICE

As I was reading your recent article, "Windows is too expensive, says Acer" (APC November 2006, page 11), I wondered just how much corporate users are paying for their Windows licences. I work for the health industry and we regularly pay fees for corporate licences to Microsoft (on top of the PC vendors also supplying PCs with Windows licences).

To cut the price of hardware further, some PC vendors have begun to stop supplying Windows, device drivers and system restore CDs. Instead, you have to create

your own restore CDs or DVD from your PC after you've finished the system installation. This is a crucial step which should not be ignored. Otherwise, you can expect a lot of trouble when your system goes down.

In one case, an Acer TravelMate 8200 laptop was supplied to our company with a faulty hard disk. As my colleague could not install the laptop, she called the Acer technical support line. She was totally amazed when she was advised to try first to rebuild the system with restore CDs. How can you restore the system when you have not had an opportunity to create such CDs? Luckily, I had

a restore DVD (created from a previous installation). We tried but failed. Finally, the Acer support team replaced the hard disk in our laptop, but the system in it did not have the provision to recreate restore CDs.

Kiran Manandhar
Glenmore Park, NSW

Kiran wins this issue's Letter of the Month prize, a Logitech MX3000 cordless laser mouse and keyboard set valued at \$179.95.





Windows: like buying a jalopy, according to Lauren from Qld.

it might get lost, but it never gets fully removed.

Lauren Hyde
Birkdale, Qld

KEEP IT SIMPLE, STUPID

Having read your beta test review of Microsoft ISA Server 2006, I can see I don't need any experience with security software (which is lucky, since I don't have any) to know the core problem here. This product is simply features, features! Ooh, it's a firewall with load balancing, deep packet inspection, HTTP compression, SSL encryption, VPN tunnels and web content publishing features built in! Will they add intrusion detection in the next version? A lot can be said for security in simplicity. This product definitely doesn't have it.

Timothy Goddard
Wellington, NZ

BEAM ME UP

I just wanted to express my appreciation for your recent coverage of Linux, particularly the Ubuntu distro. I hadn't actually realised how bored, frustrated and numbed I had become with Windows and its apps until I discovered Ubuntu as a viable alternative, thanks mainly to APC. After working behind so many layers of third party virus/adware/malware protection and firewalls, not to mention Microsoft's regular forays into protecting me, upgrading me and generally supervising my use of its operating system, I had come to accept



that as the way we must work. Less than four months ago I dipped my toe into the Linux pool with the Ubuntu Live CD/DVD and found that the water is just fine. There was a learning curve, but I've become a convert. I still look forward to reading APC each month, but I find myself flicking over the articles and reviews of Windows software and all the Vista hype (and instead read the Linux articles and search the hardware reviews for info on whether native Linux drivers are supported). I'm sure Ubuntu won't be threatening MS dominance of the desktop any time soon, but please keep up the good work and remember those of us who have now left the MS mothership.

Paul Garrett
Canberra, ACT



IE7 IS OUT!

Hmm, so tabbed browsing finally comes to IE. All in all, not that much different. OK, I know that it's the first major update in years; I know that it will break some apps (Juniper has warned that its VPN product does not support IE7). Most of what is better about it is in fact hidden from the user, but I do like the integrated RSS reader (though far from unique in a web browser). Still, looking at some of the bugs I've experienced, I can't help



Reader Ken discovered we weren't lying when we said you can DIY!

wondering if MS could have spent more time on it.

Michael Schipp
Botany, NSW

DIY HTPC: THE SYSTEM WORKS!

I just read your review of the Alloys International MediaHub (APC November 2006, page 40) and have also recently finished building my own home entertainment system based around a computer — I did the research for it and it was much cheaper than the MediaHub. It's based around an AMD Athlon 64 x2 dual-core processor (3600+ 2.01GHz) with 2GB RAM. Inside are two Maxtor 7V250F0 SATA drives, an Nvidia GeForce 7600 GS, Realtek AC'97 for audio, a Fusion HDTV card and a BenQ DVD DD DW1650 for DVDs and burning. All kept safe in a Silverstone matte black case, with an Aiko 68cm LCD TV, plus a Pioneer audio/video multi-channel receiver (130W x 7) and five Accusound Theta speakers (200W). Just thought I'd send you a line showing you can build your own media centre if you look around and spend a bit of time researching what you want to do with it.

Ken Griffiths
Lawnton, Qld

apc

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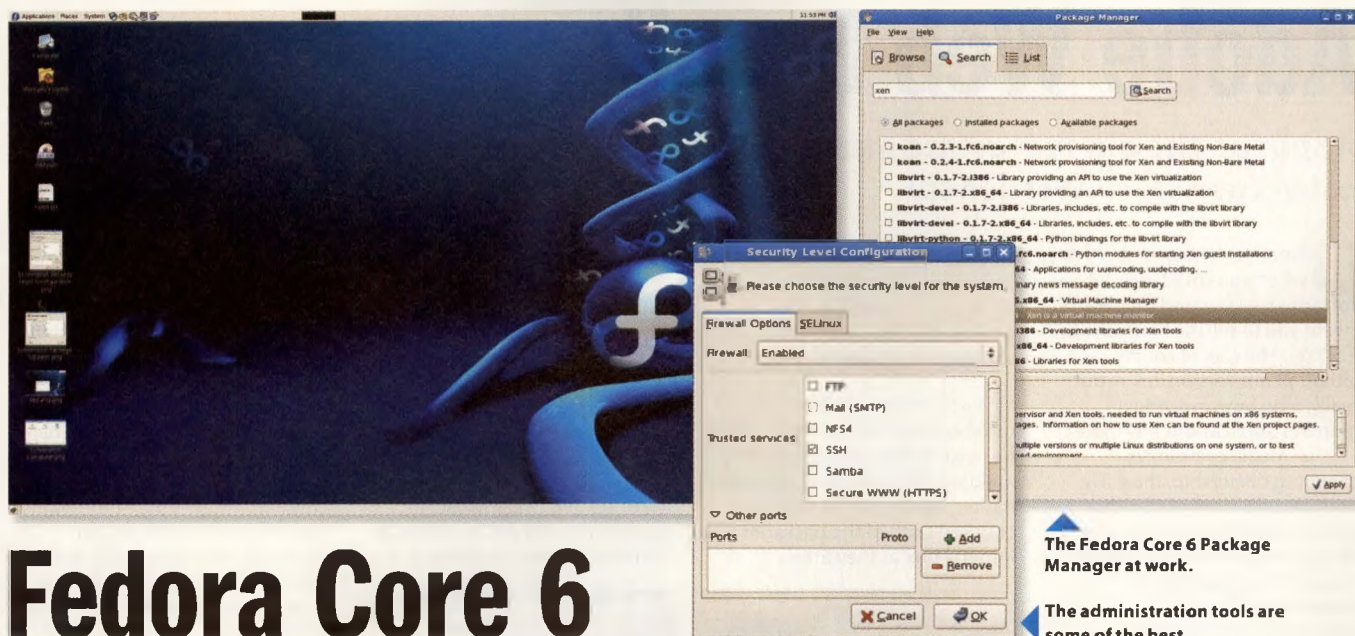


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Fedora Core 6

Red Hat's sponsored distribution reaches another milestone with Fedora Core 6.

Fedora Core 6 is the latest version of the community-driven, Red Hat-sponsored Linux distribution. Like its parent, Fedora focuses on the complete package that performs as well as it looks... well, almost. There's no doubt the latest version is a much anticipated release, but it's not quite as streamlined as it could have been.

Unfortunately, the bugs started with installation, where attempting to add extra repositories from the internet crashed the installer. Deciding not to go that route, it then insisted it wanted to install the GRUB boot manager on "sdb", the second SATA disk in our test system, and not where we wanted it to be. Finally, after getting it installed, an unbootable kernel was installed because we opted to include the virtualisation packages — meaning the popular Xen — and, for some reason, the Xen-enabled kernel was kaput on our Athlon 64 test bed.

OK, it doesn't like anything outside plain vanilla, so we ran a stock install, letting it go default all the way and it worked just fine. Beautifully in fact, as Anaconda, Fedora's installer, has come a long way from its Curses (text-based) roots to be an excellent install tool.

Upon rebooting, before reaching the desktop, the user is prompted to configure Firewalling, SELinux and sound among other essentials in a simple easy to use interface. Top marks here.

With Gnome as the default desktop and the move to a new stock font, DejaVu, Fedora is easily one of the prettiest distributions available at the moment. It oozes a polished charm that's instantly appealing. Gnome helps of course, with its minimalist approach, but the new font and the popular Clearlooks theme works well. It even comes with wide-screen, dual-monitor and dual-widescreen monitor versions of the Fedora wallpaper!



FEDORA IS EASILY ONE OF THE PRETTIEST DISTRIBUTIONS AVAILABLE AT THE MOMENT; IT OOZES A POLISHED CHARM

The DVD release comes with a host of extra packages to install, including KDE 3.5.4 to complement the Gnome 2.16 desktop. XGL is also available and installed by default, but enabling Desktop Effects to start it didn't work on our system, even though it's supported by the Nvidia drivers. The Add/Remove Software reveals Red Hat's standard package group system, which includes categories like Applications, Development and Servers with

sub-categories for everything from administration tools to virtualisation, which we'll come back to in a moment.

Firefox 1.5.0.7 is the chosen browser and probably a good move since Firefox 2.0 is still having growing pains, and Open Office 2.0 is of course the stock suite along with Evolution for email.

In terms of performance, Fedora is quite fast, with applications loading quickly, likely a combination

needs kernel support, specific Xen kernels and associated modules are also provided. We've covered virtualisation in the past, and it's certainly going to get a boom as multi-core processors and virtualisation software allow you to run multiple operating systems at the same time at full speed.

While the polish on the interface is great, the same can't be said for its operation. Bugbears include Samba shares that would report as

CONTACT	N/A
PHONE	N/A
ONLINE	http://fedoraproject.org
MARKET	Everyone
PRICE	Free

✓ Polished; easy to use; bundles XGL and Xen.

VERDICT ★★★★★

✗ Install and desktop usage bugs.

inaccessible on first click, but always work on the second. Totem, the media player, doesn't even start and instead reports an error that it can't write to resources. And, more a UI preference, the default open new folder display is a royal pain. If you use anymore than a few directories, your desktop gets cluttered quickly. And this can't be easily turned off in the interface.

All up, Fedora Core 6 has a lot of polish but doesn't quite live up to its presentation. Somewhat major install and minor interface bugs could have been easily fixed. These issues aside, it's a good release from the Fedora community.

Ashton Mills

Adobe Web Bundle

A spin on the old real estate maxim: software is all about convergence, convergence, convergence.

Remember the quaint old days when you could walk into a software supplier and say, "Harry, I want you to sell me Photoshop 2.5." You still can, of course — although not version 2.5 — but really, who buys individual graphics applications any more?

Like media companies changing ownership, the early noughties saw a shake up that repositioned the major graphic design tools into Adobe's hands. Its audacious takeover of Macromedia late last year assimilated the major web design applications into its collective as well. It's telco deregulation in reverse — where there was once Quark, Aldus and Adobe battling it out, now Adobe is the potential monopolist of digital graphics.

Of course, the good thing has been the opportunity to kit out your whole studio with one purchase and feel confident you won't have compatibility problems to deal with.

As more print graphic designers have embraced online graphics, somebody must have asked themselves, "wouldn't it be great to offer the industry standard print and web design packages in one box?"

Cue Adobe's acquisitions department — and the rest is history. . .

Any serious review of the Adobe Web Bundle has to compare it to the M.O. of both Macromedia Studio and Adobe Creative Suite. Not because it comprises both those packages, but because Macromedia and Adobe respectively set the benchmarks for individual software packages being able to work together.

Adobe did a better job of it than Macromedia, stitching their apps together with tools like Version Cue and the Adobe Bridge, both of which have grown more robust over time, regardless of their relevancy.

• **CONTACT** Adobe
• **PHONE** 1300 550 205
• **ONLINE** www.adobe.com
• **MARKET** Enterprise/SMB
• **PRICE** \$3,399

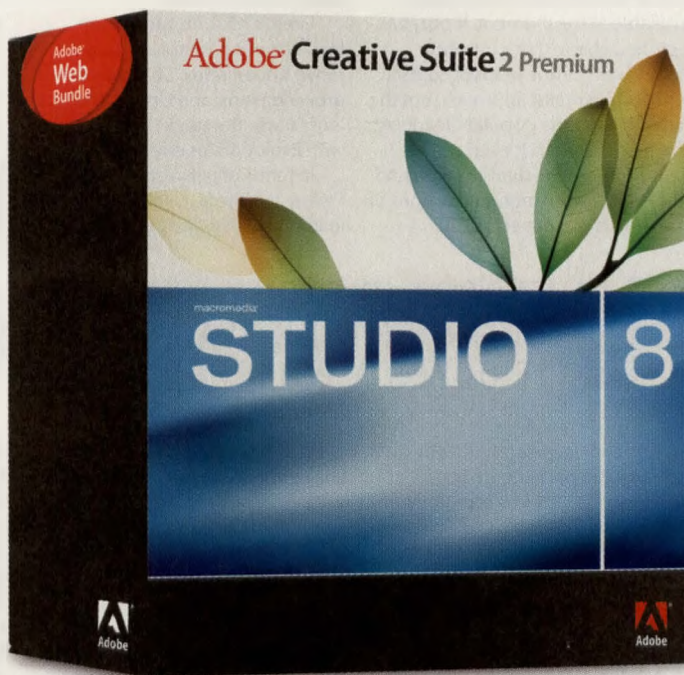
Sadly, there isn't much to tell about the Adobe Web Bundle, because there's no such similar melding of the cultures going on. Rather, Adobe has literally just chunked both of the packages into the box as they are —

✓ Value for money if you're just starting out.

• **VERDICT** ★★★★★

✗ If you're not, you're likely to already have both individual packages.

Adobe Creative Suite 2 Premium (containing Photoshop 10, InDesign 4, Illustrator 13 and Acrobat 8) and Macromedia Studio 8 (containing Dreamweaver 8, Flash Professional 8, Fireworks 8, Contribute 3 and Flashpaper 2).



Now, there's nothing inherently wrong with that. If you need a kettle and a toaster, you can expect to buy them both from the same supplier and pay less than the sum total in return for your valued business.

Adobe has set the bar too high for itself with CS2, and you expect the same sort of unity in a box that contains Adobe's major programs. It didn't just throw InDesign, Illustrator, Photoshop and Acrobat into a box and call it Creative Suite — it put a lot of development and effort into transforming them into the branches of a design hub.

Of course, engineers are probably tinkering away in the Adobe labs as we speak to bring us the Grand Unified Theory of Graphic Design. As long ago as March 2006, a news story on Macrumour site thinksecret.com claimed CS3 was in development. If there's any reason not to buy the Adobe Web Bundle, that's it. The first two versions of Creative Suite were barely more than a year apart. CS2's now 18 months old, but Studio 8 only appeared in July this year. You can decide how far away a truly integrated mega-product is.

If you can't wait, there's only one criteria to use to weigh up a purchase of the Adobe Web Bundle — price. It retails at \$3,399. Alone, CS2 costs \$2,199 and Studio 8 costs \$1,559 — a total of \$3,758 (RRP).

If you're starting your own design studio from scratch, or you're working on software so old that it makes sense to upgrade it all at once, Adobe Web Bundle will be the most value-for-money purchase you'll make on software this year. But, if you've shelled out for either version of Creative Suite, Studio 8 or even the last bundle under Macromedia's ownership (Studio MX), they'll keep you going until Adobe comes along with a killer converged application set.

Drew Turney



Dell Latitude D620

Top-end CPU in a budget notebook.

If you've been following APC for the past few months, you'll know well and truly Intel's Core 2 Duo range is the pick of the CPU market at the moment. The mobile version of the Core 2 Duo (codenamed Merom) saw the light of day recently, and Dell's system designers have jumped on the new chip for their newest range of notebooks.

The Latitude D620 is a business-oriented smaller form factor notebook model, available in either 14.1in or 15in models. We received the 14.1in version, which runs the panel at a native 1,440 x 900 (WXGA+) resolution, less common than 1,280 x 900 (seen in most other notebooks this size). The

screen is tight and bright, with a matte finish best suited for work under fluoro lights.

This model was equipped with a Core 2 Duo T7400 running at 2.16GHz. The system is built around the Intel 945GM chipset, which also provides graphics using the GMA950 and shared system memory. The D620 was kitted with 1GB of DDR2-533 and an 80GB 5,400rpm Hitachi hard disk drive. The included optical drive supports CD and DVD+-RW burning at 8x. 802.11ABG, Bluetooth and Gigabit Ethernet are all included. The D620 has PC Card, but no ExpressCard support and offers four USB 2.0 ports for connectivity.

CONTACT Dell
PHONE 1800 812 313
ONLINE www.dell.com.au
MARKET SMB
PRICE \$2,789

✓ Solid performance; good battery life.

VERDICT ★★★★★

✗ No ExpressCard; uses GMA950.



On the bench, the Latitude D620 performed to an acceptable level. PCMark05 clocked the unit with a score of 3,452, 3DMark06 gave the GMA950 the usual poor score of 2:36, while the battery on the unit lasted four hours, 23 minutes under load. Performance and battery life were middle of the road, which, considering the price on the system isn't bad at all.

The D620, though not sold as a lightweight unit, is more

portable than luggable. It weighs in at just over 2kg including the battery, and though it's far from thin and light, it won't dent a briefcase or backpack too much. This model was, frankly, hard to get excited about. Though it has no unique features, it's got a solid mix of performance, connectivity and portability. For a business user or student, the D620 would suit them down to the ground.

Nick Race

i-mate JasJam

This smartphone gets close to road warrior nirvana.

Built for the mobile professional, the i-mate JasJam is a PDA and 3G phone with a QWERTY keyboard. At just 176g and 113 x 58 x

22mm, it's a very impressive, pocket-sized device. Built by HTC for i-mate, it's also marketed under the names HTC Hermes and Dopod 838Pro.

Our JasJam was connected to Telstra's NextG network, so we were able to browse the web and retrieve email. In addition, there's integrated 802.11b for connecting when in the office — or near a hotspot. Connection to a desktop requires the bundled ActiveSync application using either USB or Bluetooth. Using Bluetooth, it's also possible to connect the JasJam to a laptop and use it as a wireless modem to get connected while travelling. If you connect to an Exchange server, you can use the JasJam for

CONTACT Club i-mate
PHONE 1300 859 513
ONLINE www.clubimate.com
MARKET Everyone
PRICE \$1,299 (Telstra); \$959 (3)

✓ Full comms; software; ease of use.

VERDICT ★★★★★

✗ Inbuilt storage; Telstra config.

instant email access — making it a strong rival to the functionality of the BlackBerry.

Running Windows Mobile 5, the i-mate JasJam ships with a suite of various Office applications for editing Word and Excel documents — and for viewing PowerPoint presentations. In addition to this, i-mate bundles eTrust Antivirus software, ClearVue PDF viewer and backup software.

There's 56MB of available storage and 49MB of program memory. This is adequate for a few apps, but if you plan to carry lots of documents and the odd music or video file (or take a few shots with the 2MP camera), you'll want to use the Micro SD slot to boost the capacity.

When the slide-out keyboard is deployed, the 2.8in 320 x 240 display automatically toggles to landscape mode from the default portrait orientation. With the keyboard closed, it's possible to use the JasJam single-handed as all the buttons and controls are easily accessed.

One problem we faced was that Telstra's default configuration had the JasJam automatically setting its timezone to Hobart. That meant that we had some trouble syncing appointments to the correct time. Once we turned off that setting, all was well (but it was annoying).

Other than the timezone issue, the JasJam is an excellent device that we found hard to flaw.

Anthony Caruana





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- Light 3.2Kg

RRP \$2,499

www.msicomputer.com.au



02 8831 9999
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08 9242 8822

Epson Dreamio EMP-TW700

Epson's new home projector is a quiet success.

Just like LCD monitors, the specs for home video projectors are usually a load of twaddle. Epson isn't an exception to this rule, with the Dreamio EMP-TW700 listed at a mind-bending 10,000:1 contrast ratio of 1,600 ANSI Lumens.

Now, the brightness we can accept, though it measures nothing near that: it's comparable to units on the market that advertise the same brightness. Although, the contrast ratio is just amusing. That's not saying the projector isn't good, or even great! It produces an excellent wide-screen image at 720p resolutions (with a max. image size of 9.61m wide) and outstanding colour and performance.

Specs aside, as a projector, the Dreamio EMP-TW700 is a winner. It supports a wide range of inputs, including HDMI, D-Sub, S-Video, composite and mini-SCART. It supports NTSC, PAL and SECAM in various flavours, plus a RS-232 connector for remote control or home automation. The lens can be manually redirected, if your positioning for the projector isn't ideal (keystoning), and focus is easy to pull (and doesn't shift when the projector gets hot — a major bugbear of mine).

The remote control is simple, and controls all the projector's functions. It's large, clearly marked and one of the better examples of a projector remote we've seen.



However, we were pretty surprised to hear just how loud this projector is — or, more accurately — isn't. The EMP-TW700 is a very quiet unit, perfectly suited for the home, where loud fans tend to drown out a movie very quickly. The projector does move a lot of heat, so ensure it's adequately ventilated when installing. Keep in mind that the unit is huge, measuring 406 x 353 x 143mm (including the protruding lens), so it may be a bit difficult to mount or place.

The Dreamio EMP-TW700's image quality was good. Crisp 720p via HDMI — and the quality from Epson's 3LCD technology is particularly evident. It would be nice if Epson bundled in some HDMI and video cables — or a DVI-HDMI converter in with the unit — as there's only a power cable thrown in the box.

Nick Race

CONTACT Epson
PHONE 1300 130 194
ONLINE www.epson.com.au
MARKET Everyone
PRICE \$2,999

✓ Clear image; quiet.

VERDICT ★★★★★

✗ Runs very hot; very big.

Philips Cineos DVDR9000H

Going PVR no longer means choosing between a digital tuner and a DVD burner.

Philips' Cineos DVDR9000H sports a combination analogue and standard definition digital tuner, along with a DVD+-R/RW, DVD+R dual-layer burner and a 400GB hard drive good for 650 hours of recordings. It lets you pause and rewind live TV, plus watch the beginning of a show while you're still recording the end.

There's no draconian copyright protection at play, so you can record digital television straight to DVD and transfer recordings from the hard drive to DVD. What is draconian is the fact it ships locked

CONTACT Philips
PHONE 1300 363 391
ONLINE www.philips.com.au
MARKET Everyone
PRICE \$1,729.95

✓ Digital tuner and DVD burner.

VERDICT ★★★★★

✗ Not dual-tuner; not HD.

into Region 4, but Philips says you can contact it for instructions on making it region free.

All bases are covered when it comes to outputs: composite, component, SCART, S-Video and HDMI, but, disappointingly, the only rear input is one SCART port. DV, composite and S-Video inputs are hidden beneath a fold-down panel on the front.

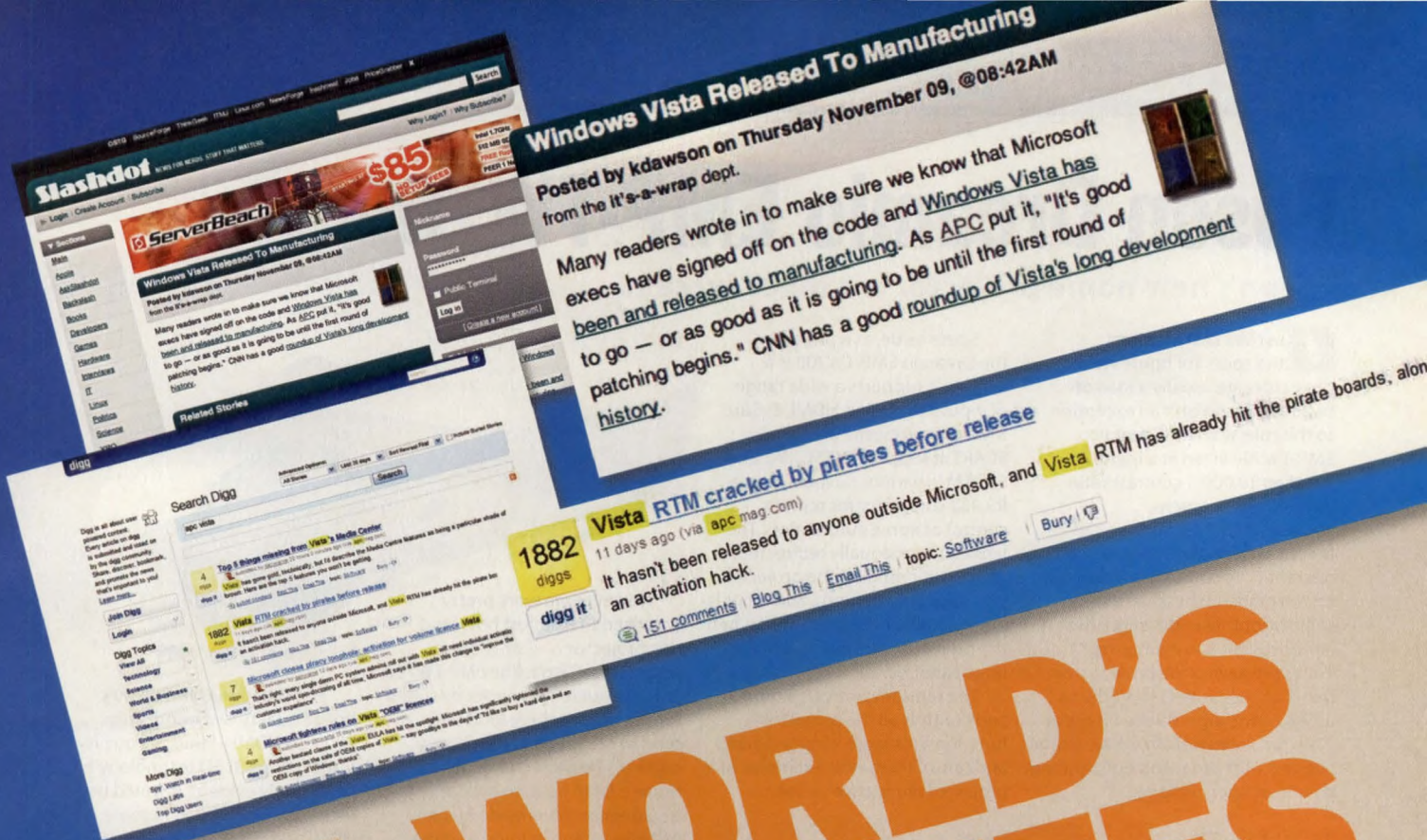
The recorder automatically buffers up to the last six hours of whatever you've been watching and, unlike most PVRs, the buffer is not reset if you change channel. The benefit of the analogue/digital tuner is if reception breaks up on one you can quickly switch to the other — but obviously you'll lose this when analogue broadcasts end some time after 2010.

The major disappointment is that, unlike PVRs with proper dual-tuners, you can't change channel while recording (or record two programs at once). The lack of a high-definition tuner and DivX playback are also disappointing. So is the fact you can't use the seven-day electronic program guide — but blame the television networks for that. While Philips has been innovative with the interface, the buffer timeline is difficult to read — and the fact that menus don't show all options at once is frustrating.

This recorder had the potential to really offer something special, but the lack of a proper dual-tuner and HD prove to be major disappointments. While a digital tuner and DVD burner in one device is a serious step towards attaining true lounge-room bliss, the Cineos DVDR9000H asks you to sacrifice a lot in return.

Adam Turner





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ExBoot Backup & Recovery Drive

Fits in your pocket and protects your data.

The ExBoot series from Axiomtek is a range of drive enclosures (with bundled backup and recovery software) which is available in a few form factors.

We were sent the smallest of the ExBoot family, the EXB-0111, designed for use with 1.8in (iPod size) hard disk drives. The EXB-0111, including the provided 40GB Hitachi hard disk drive, measures only 80 x 96 x 16mm and weighs only 80g. It really is small enough to slip in to a pocket. There are also ExBoot devices designed to hold 2.5in and 3.5in drives.

What differentiates the ExBoot from other small portable hard disk drives is the included software. All devices in the ExBoot family ship with the branded ExBoot backup software, which allows full, incremental and timed backups to the drive whenever it's connected. The killer is the device is designed to restore from a full system failure,

right off the USB disk. Just back up a Windows partition using the ExBoot software and, should the worst happen, you can boot off the ExBoot device and restore the image with a minimum of fuss.

None of this is new functionality; backup software like Backup Exec offers restore functionality, but you need an optical disk to boot from to access your restore points. Similarly, the ExBoot has a "one touch backup" button most often seen on the Maxtor range of direct attached storage devices. (But the ExBoot unit has all of it together.)

This little drive supports full USB 2.0 transfer speeds, powered from USB ports (it takes two USB ports to give it enough juice if you're

running from a notebook). In a straightforward file transfer, the ExBoot took six minutes, 41 seconds for 5.5GB of mixed data from a WD Raptor 10,000rpm SATA hard disk drive.

Our testing of the backup software bundled with the drive showed it capable, but bland. It's quite a simple backup service by design;

however, both complete and incremental backups worked perfectly during our testing. Restoring from the ExBoot was also a no-brainer — booting off the drive and copying files back on the PC that we artificially "wiped" was a quick and easy process.

Nick Race



✓ Tiny and fast.

VERDICT ★★★★★

✗ Draws a lot power off notebooks.

CONTACT Eureka Pacific
PHONE (02) 9439 7553
ONLINE www.exboot.com.au
MARKET Everyone
PRICE \$399

Extensis Suitcase Fusion 12.0

Can Extensis produce the font management solution that Mac users need?

It started badly. APC tested Suitcase Fusion on an old but perfectly functional G4. The reason was to benchmark it against the app that posed the only real threat to Extensis' ownership of the font managements scene, Font Reserve. If Diamondsoft's stripped-back font manager worked on such a system, there was no reason Suitcase Fusion shouldn't as well.

After installation, Fusion scanned the system fonts automatically, and then we were able to copy the remaining fonts from around the computer into the Suitcase window.

Trying again with a DVD of even more fonts, Suitcase crashed every time. Sure, it might not be designed to handle an incoming 4GB of fonts, but plenty of publishing houses have libraries

CONTACT Pica Australia
PHONE (03) 9388 9588
ONLINE www.pica.com.au
MARKET Prosumer; enterprise
PRICE \$169

✓ Activates fonts as you open your document seamlessly.

VERDICT ★★★★★

✗ Buggy, bloated and drains resources too much.

that size, and nobody — least of all layout artists on deadlines — has time for prima donna software.

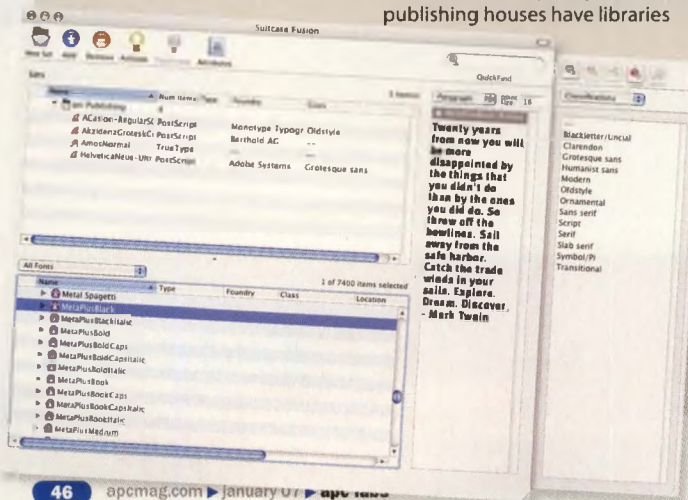
Now part of the Extensis stable, Font Reserve provides the best new feature to Suitcase. Rather than leave fonts wherever it finds them, it now copies every one to a custom-made folder (called The Vault) that gives you deeper access into each font family.

The biggest drawback with Suitcase is the bloat it suffers. It takes much longer than it should to start up, as it performs a new system scan every time — very cumbersome if you have lots of fonts. Few designers change their system fonts much — hence the need for font management software to begin with.

In fact, the biggest irony of font management is the now-standard function of Suitcase automatically activating the fonts in your document as you open the relevant application. It almost does away with the need to collect them into job suitcases, although dragging and dropping the set to the desktop to send to your output bureau is one of the handiest features if you have a large set.

Several small bugs like the Hide command (Apple + H) not working indicate one of two things: either a rush to market or a conflict with a common Mac system component. Either way it contributes to what is a sound idea but a flawed product.

Drew Turney





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Lexmark C500n colour laser printer

Good colour on the cheap? Let's C.

Colour laser printing, especially in resolutions over 600dpi, has been an exercise for the terminally rich or those with a bottomless budget. However, Lexmark has been talking up its new C500n colour laser as a price-sensitive printer for the work group.

Its specs say all the right things: a 1,200 x 600 dpi print with monochrome running at 31ppm and colour at 8ppm. Lexmark advertises a fast 13 seconds first page (mono) and 19 for colour. It runs a 200MHz processor and comes stock with 64MB of RAM. The C500n connects via 10/100 Ethernet or USB. There's no option for Wi-Fi connectivity. The printer has a 250-page input tray; an additional 500-page tray is available for \$352.

The C500n supports Legal to DL, but there's no support for smaller paper sizes. However, it does support printing on transparencies. The unit uses a CMYK four-colour

process, with maximum capacities being cartridges offering 3,000 pages for colour (\$209) and 5,000 for mono (\$235.40). The printer ships with 1,000 page "starter" cartridges in the box.

In testing, the C500n both lived up to and failed some of its claims. On the document print side, the first page out (which included a colour logo) took 22 seconds, not the 19 as advertised. The 20-page printout took two minutes, 41 seconds: a good result compared to the fastest entrant of our last MFC Labs Challenge (APC August 2006, page 70), the OKI C5510MFP (with two minutes, 49 seconds). Conversely, our Test Target images, used for colour and quality comparison, took a whopping one minute, 10 seconds to print (compared to the fastest MFC in our Challenge — at 20 seconds).

What really struck us is the terrible quality of the photo print.

Out of the box, the colours were out, with banding and speckling evident in the image. After much tweaking it improved, but was still far from optimal. The text printout is fine — and I wouldn't hesitate to recommend it for business use — but if you need to print even the occasional full-page colour or brochure, look elsewhere.

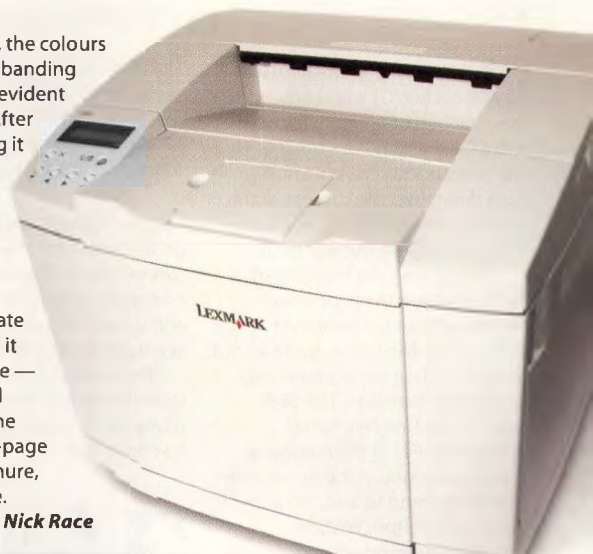
Nick Race

CONTACT	Lexmark
PHONE	(02) 8401 3000
ONLINE	www.lexmark.com.au
MARKET	SMB
PRICE	\$676

✓ Good quality text/report; fast as lightning.

VERDICT ★★★★★

✗ Slow sub-standard colour prints.



Sony DPP-FP55 Photo Printer

This tiny printer produces big results.

Despite being both an established player and an ongoing innovator in the digital photography scene, we don't often think of Sony when someone asks for a home 6 x 4 photo printer recommendation.

So, when Sony recently launched its DPP-FP55 Photo Printer, a dye-sublimation unit with a competitive sub-\$300 price tag, we were eager to take it for a spin.

Slightly different in nature to inkjet printers such as HP's Photosmart 475, it uses a four-pass mechanism, spitting out a cyan, magenta and yellow mask before coming back to coat the print with a protective layer. It's reasonably fast at just over a minute per print and does the job quietly, until it gets to the coating: then it sounds like it's stretching Gladwrap over the photo. Even still, it's not so bad that you wouldn't want it in your lounge room (and you may want

to as it can operate independently of a computer).

The integrated 2in LCD screen lets you preview and edit images for colour, saturation, brightness and add a few basic effects, while Pictbridge and SD/MS card readers give people the flexibility of going straight from the camera to the fridge door without messing around. Sony does bundle album software for those who want to use it with a PC, and it does a reasonable job, reading camera data to tag your photos and sort them into a calendar view to show when they were taken.

Printing our test targets and sample photos, we were extremely impressed with the print quality, each showing bright colours

without oversaturating. Skin-tones were even and blemish-free and our only real concern was some very slight banding in a few solid colours (but certainly not enough to jeopardise the quality of the print).

A barebones printer, it does basic editing, although the lack of a battery for portable printing is a bit of a shame, even as an extra. Unlike the other models in Sony's printer range, the DPP-FP55 appears to only have a single ribbon and paper pack at \$59.95 for 120 sheets, which seems a lot for infrequent printers.

That said, if quality photos at home are your big concern, this printer will certainly do the trick.

Dan Chiappini



CONTACT	Sony
PHONE	1300 137 669
ONLINE	www.sony.com.au
MARKET	Everyone
PRICE	\$279

✓ Excellent-quality photo prints.

VERDICT ★★★★★

✗ No battery; large consumable pack.

EVGA Nvidia 680i motherboard

For Core 2, Intel's held the motherboard market — but this will shake them up.

Nvidia unveiled the 680i with the 8800 GTX recently, with the clear aim of taking back market share for the popular Core 2 CPU. The nForce 500 series of chipsets hasn't matched the success of the previous generation nForce 4, so Nvidia is back on the war path.

Considering the majority of people buying these premium setups are true performance enthusiasts, Nvidia has gone all out to cater to their particular needs: speed and flexibility. The 680i board is the first Nvidia has manufactured, so the company was able to control the production from beginning to end. What this means is a custom BIOS, a standardised product and predictable results. Of course, the Taiwan contingent has been allowed to purchase the 680i chipset for its own designs, which won't be available until early 2007.

In a nutshell, the 680i is a performance motherboard with massive overclocking capabilities. The board includes the usual support expected in a modern system, six SATA 2 ports (running from Nvidia silicon, not a third party), PATA for optical support, three PCI Express x16 slots for SLI (with a third available for upcoming physics solutions). Two of the PCI Express x16 slots actually run with 16 lanes, while the third runs with eight lanes. There's two gigabit Ethernet ports, ten USB 2.0 connections (six external, four internal). There's full support for Core 2 Duo and Core 2 Quad processors with a 1,066MHz frontside bus. It seems someone at Nvidia has been listening to the enthusiast community when designing the board: small touches like a larger space between the end of the RAM slots and the PCI Express slots, allowing for a better fit for larger video cards; SATA ports moved above the PCI Express slots for easier cabling; and plenty of clearance around the CPU socket for large coolers or water-cooling solutions make it easier to build a high-end

.. CONTACT Shadow Entertainment
.. PHONE (03) 9785 6570
.. ONLINE www.shadowentertainment.com.au
.. MARKET Performance enthusiast
.. PRICE \$450

✓ Solid, fast overclockers board.

.. VERDICT ★★★★★

✗ Very minor niggles.

system. It sports seven fan headers on the board for the whole wind-tunnel effect. There's even power and reset buttons on the board to allow open bench usage or quick access without cabling to a case.

The 680i MCP is built for speed. Overclocking is the name of the game for this platform, and Nvidia has done well. Right off the bat, the

1,650MHz (the board supports up to 2,000, realistically), while we happily ran a Core 2 Duo E6300 with a 2,000MHz frontside bus and air cooling. On the bench, the 680i, with the QX6700 at stock speeds, using a Corsair Dominator 9136C5D TwinX 2GB kit at 1TB and an 8800 GTX, squeezed out a 7,793 PCMark05.

speeds on the fly, so no more scratch pad scribbles to work out clock speeds. It's easy, and it works.

Our complaints are the usual with this board: the blocking of smaller PCI Express slots or PCI slots when double-width cards are installed and the lack of pre-wired or adapted case front-panel connectors (after seeing this on an ASUS board, we can't go back to slotting small plastic tubes over metal pins). A CMOS reset button would also work nicely with the overclocking context, but you need to resort to changing a jumper in



NVIDIA HAS GONE ALL OUT TO CATER TO PERFORMANCE ENTHUSIASTS PARTICULAR NEEDS: SPEED AND FLEXIBILITY

680i supports memory at 1,200MHz (DDR2-9600, anyone?), which will shortly be available from enthusiast memory manufacturers like Corsair, OCZ and the like. Secondary to that, the 680i MCP has full support for EPP memory modules, which allows the modules to dictate to the MCP its maximum settings and overclock automatically to aggressive, but supported, settings.

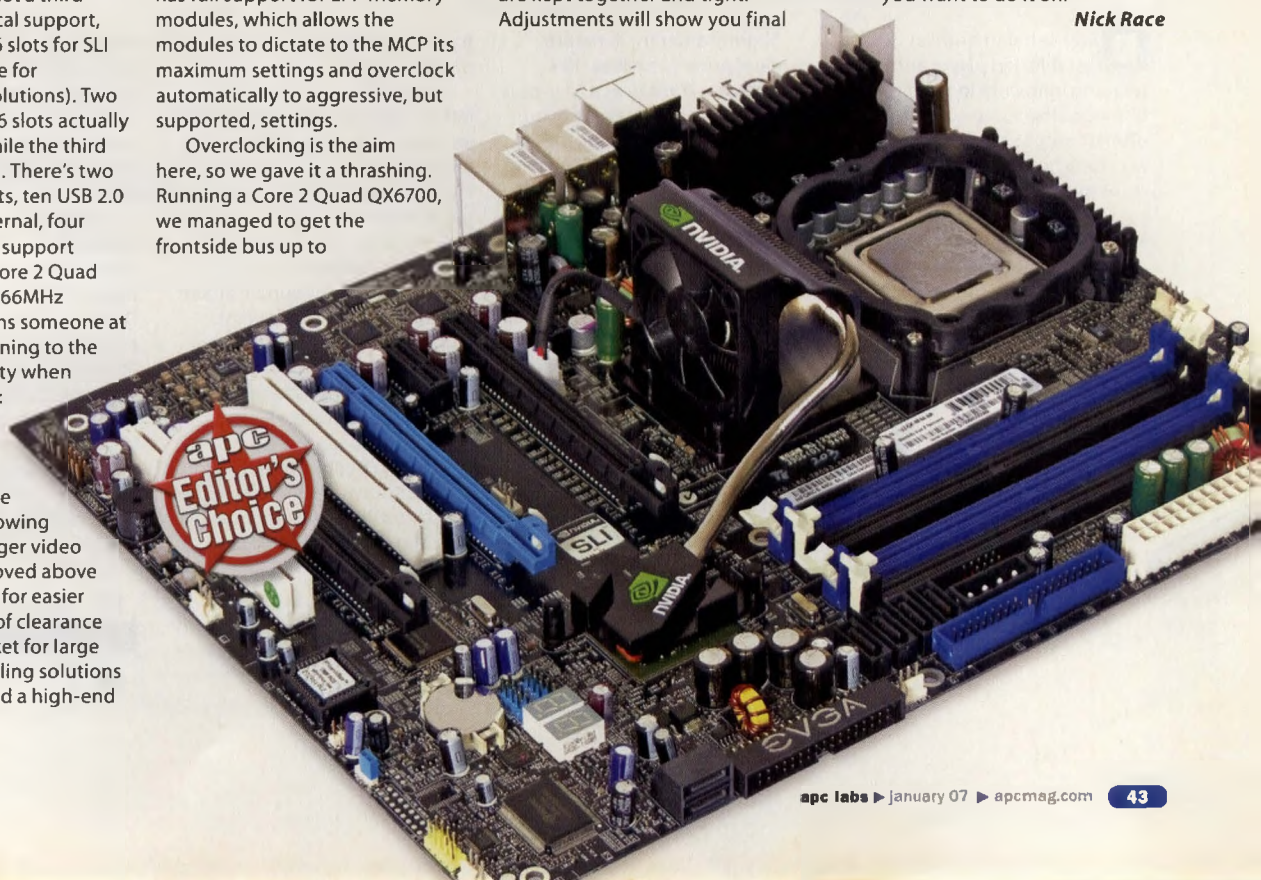
Overclocking is the aim here, so we gave it a thrashing. Running a Core 2 Quad QX6700, we managed to get the frontside bus up to

A special mention must be made for Nvidia's BIOS. Catering to the overclockers, all relevant settings (frontside bus, HT speeds, PCI Express overclocking, voltage adjustment and memory timings) are kept together and tight. Adjustments will show you final

case of catastrophic settings. In reality, these are minor complaints.

It comes down to this: if you're building a high-performance PC based around a Core 2 Duo or Core 2 Quad, this is the motherboard you want to do it on.

Nick Race



Thermaltake Mozart Tx

Too many PCs and not enough space? Check this out.

We applaud the innovation and the weird and wacky development that goes on in the IT space. Even after all this time, we still occasionally see a product that leaves us scratching our heads in disbelief, and the Mozart Tx chassis is one such example. It seems logical; if you're the kind of PC owner with more gear than space, why not combine two systems into the one case?

This chassis features enough room to park a fully working system in the right-hand side, and still has room for a Mini ITX-style system in the left. There's only room for one power supply though, so two full ATX systems are out. There's even real estate for the latest generation long-length PCB graphics cards, including the Nvidia 8800GTX and ATI's X1950XTX (if your system is a screamer).

Of course, if you don't own an ITX system, you could always fill the

disused side with a water-cooling kit, and the Mozart Tx has pre-drilled holes for threading 19mm tubing. If blinging up your PC is your bag, then there's even a \$599 7in retractable LCD display and a mod kit to allow the case to be used with BTX cooling — for both of you that bought them. The case has front-mounted support for eSATA though, including powered devices which will be handy when the hype takes off.

There are a couple of niggly little issues, namely the length of the board screw risers, meaning that unscrewing your motherboard usually sees it come apart with the riser attached. Tool-less optical drive slide rails are included, but you'll need a screwdriver to unlock them, and once free they tend to fall off. Hard drives screw in the old-fashioned way, but there are rubber grommets to help reduce operating noise. The entire drive bay can be

removed, populated and returned to the case to save cramped fiddling. Cooling is obviously on Thermaltake's mind, with the case packing five 120mm fans; it also has room for two more, as well as an 80mm fan.

A good idea on paper, but an odd concept to work with, entertainment PC builders will opt for HTPC cases, gamers for server/standard ATX cases and ITX users after something much smaller.

Dan Chiappini

CONTACT	Thermaltake
PHONE	(03) 9763 1622
ONLINE	www.thermaltake.com.au
MARKET	Everyone
PRICE	Black, \$399; Silver, \$449

✓ Save space with two PCs in one case.

VERDICT ★★★★★

✗ Limited usage; bulky.



MSI ATI X1950 Pro 512MB

Are you after great graphical performance on a budget?

Though the current performance king in ATI's graphics adaptor crown is the X1950XTX, the Pro version of the X1950 chip is where the bulk of the market is spending its dollars. It's not hard to see why, considering the XTX goes for over \$800, while Pros can be picked up for half that.

If it's half the price, does it have half the performance? In short, no,

the X1950 Pro is the sweet spot for a reason — its performance in current-generation games is battling above its price tag and there's no complaint here!

We put the MSI X1950 Pro on the bench with our new 680i testbench with a QX6700 quad-core processor. The Pro scored some sweet results. We ran tests at 1,600 x 1,200 and 1,280 x 1,024, the most common gaming resolutions at

the moment. All tests were performed with 4x anti-aliasing and 8x anisotropic filtering enabled. Prey clocked the system at 43fps at 16 x 12, and 52fps at 12 x 10, both comfortable speeds for playing. Quake 4 (using the same engine) showed similar results with 47fps and 61fps at 16 x 12 and 12 x 10 respectively. Source engine tech demo, Half-Life 2: The Lost Coast, run with HDR turned on, at 1,600 x 1,200 clocked the card at 89fps and 106fps at 1,280 x 1,024. 3DMark06 reported a score of 5,534, which isn't fantastic (half the stock performance of the current speed king, the Nvidia 8800GTX), but the game results speak for themselves.

MSI package their X1950 Pro with a single game, TOCA Race Driver 3. There's also CyberLink PowerCinema and PowerProducer, as value-adds. The X1950 Pros are also the first ATI cards to support their new internal CrossFire connectors, but, unfortunately, don't expect to install it out of the box. ATI demand that users order a set of internal CrossFire connectors from the ATI web site, so expect some extra expense.

The X1950 Pro is a good buy at the moment, and the MSI bundle is one of the most comprehensive (and inexpensive) on the market. If you're looking for decent performance on a budget, then you could do much worse.

Nick Race

CONTACT	MSI
PHONE	(02) 9748 0070
ONLINE	www.msicomputer.com.au
MARKET	Performance enthusiast
PRICE	\$449

✓ Good performance at a good price.

VERDICT ★★★★★

✗ A tad noisy.



Mio Digiwalker A701

Mio delivers its first smartphone, but there are few misses in the package.

The A701 is Mio's first foray into the Australian smartphone market. Coupling a phone with a GPS receiver into a mere 148g is no mean feat, but a few corners have been cut.

The A701 is a tri-band GSM/GPRS phone, but we're in the 3G era now and the lack of fast comms is a serious deficiency. There's Bluetooth 1.2 but no Wi-Fi — another significant omission. This means that we'd rule this device out of a serious road warrior's armoury. It'll be good enough for folks that just want a phone, but for data-hungry travellers these are serious misses.

The screen is excellent and was easy to read in most conditions. Maps from the integrated Mio Map application displayed clearly on the 2.7in, 320 x 240 screen. We shot a few photos with the 1.3MP camera and they were good.

Running Windows Mobile 5, the A701 makes light work of email and dealing with Microsoft Office attachments, Windows Media files and MP3s. Mio has bolstered the OS with its own Today screen plug-ins for application launching and using the GPS.

If you're buying the A701, chances are you've made that decision because you were after a handheld GPS solution. On that score, the A701 doesn't disappoint. Out of the box, you get a full set of maps for Australia on an SD card, a car mount and a car charger.

The mapping software worked well and the 520MHz processor didn't keep us waiting during route calculation.

In testing around Melbourne, we found the A701 accurate and able to get a positional fix quickly. The only hassle we encountered was when we had to divert from the calculated route on a freeway because of an accident. The unit persisted for some time in trying to get us to pull a U-turn and return to the freeway.

Storage was a little light as well. There's 64MB of user-accessible memory. That can be boosted through the SD/MMC slot, but if you're using the slot for the supplied maps then you're out of luck.

All in all, the A701 isn't a bad device — but we kept feeling that we wanted more.

Anthony Caruana

CONTACT	Mio
PHONE	1300 646 477
ONLINE	www.mio-tech.com.au
MARKET	Everyone
PRICE	\$1,299

✓ GPS; light.

★ ★ ★ ★ ★

✗ No 3G; no Wi-Fi; limited memory.



IN TESTING AROUND MELBOURNE, WE FOUND THE A701 ACCURATE AND ABLE TO GET A POSITIONAL FIX QUICKLY

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Nova5000 EX

Students and low-end users will find something to like in this nifty little UMPC.

Data loggers used to be boring machines, but the Nova5000 dispels that with its almost toy-like appearance. Don't let that put you off — this machine could find a use in a wide variety of educational and commercial settings.

Powered by Windows CE version 5.0, adults and children alike will find the Nova5000 easy to use. The familiar Windows interface is easy to get accustomed to and can be driven with either a stylus or a mouse and keyboard. While the 7in 800 x 480 screen is a little small, there's a fold-out stand so the screen can be placed on a desk and you can drive it as a standard PC. However, you'll want to invest in a USB hub if you plan to do this, as there are only two USB 1.1 ports. If you plan to use the Nova5000 regularly on a desktop then you'll welcome the VGA port for connecting an external screen.

At about 1kg, the Nova5000 is built for mobility. There's no hard disk — all the storage is solid state and you can use CF memory cards and USB sticks to boost the integrated 96MB of available storage. By omitting a hard drive, the Nova5000 has almost no moving parts, making it significantly less susceptible to damage from rapid movement. If you spend the extra \$65 on the case, you'll be happy to find it's very well padded (and can hold the power supply and optional mini-keyboard and mouse). Text entry can be either by external keyboard, soft-keyboard or handwriting recognition.

What makes the Nova5000 stand out from the crowded tablet/laptop market is that it has three special ports for connecting different probes. As it's a data-logging tool, it's designed to be used by students and technicians. We tested the temperature probe, one of over 50 probes available. We plugged it in, launched MultiLab, a logging app, and began recording readings.

For students, a touchscreen and some logging tools aren't enough. The Nova5000 acts as full replacement for the laptops many schools are recommending for their students. Instead of the Windows CE slimmed-down versions of Word,

• **CONTACT** OZIntell
• **PHONE** (02) 4948 2200
• **ONLINE** www.ozintell.com
• **MARKET** Education
• **PRICE** From \$1,243

✓ Robust; connected.

• **VERDICT** ★★★★★

✗ Not enough USB ports.

Excel and PowerPoint, the Nova5000 is bundled with TextMaker, PlanMaker and Presentations. These are fully featured apps; plus, there's a PDF viewer, Internet Explorer 6 and MS Paint (and you can access a plethora of third party applications). The Nova5000 could theoretically replace the traditional student's kit of pens and exercise books.

Multimedia has become an important part of education. With the 5000's integrated speaker and microphone, students will be able to record notes and listen to the audio on videos that play though

Windows Media Player. There are also standard 3.5mm sockets for external mics and speakers.

Connectivity to school and office LANs is covered by both 802.11g Wi-Fi and RJ-45 Ethernet. In addition, the unit can be connected to a Windows PC and use ActiveSync for transferring files from a desktop system by USB. While there's a web browser for hitting the web or school intranet, educators will be happy that there's no IM client pre-installed and that, at this time, there aren't any viruses that attack Windows CE. This is a great benefit

for administrators deploying the Nova5000. Connection to POP and IMAP servers with the provided email client comes as standard.

Battery life is absolutely critical to a device of this type. The 4400mAh sounds hefty, but it's powering Wi-Fi, an LCD and data logger. The battery is rated for four hours use — we found that we could use the Nova5000 for about three hours while surfing the web over Wi-Fi, using a probe and entering some text with a mouse and keyboard. The battery is user-changeable, although you will need to remove two screws to get to it.

There's a lot to like about the Nova5000: it's robust, easy to use and can handle most of the functionality a student will need.

Anthony Caruana



THE NOVA5000 COULD THEORETICALLY REPLACE THE TRADITIONAL STUDENT'S KIT OF PENS AND EXERCISE BOOKS



DirectX 10 at a technical and practical level. The 8800 also now includes a stream out during the pipeline operation — the card can store data that has passed through the vertex shader processors back to the beginning of the pipe, allowing multi-pass operations on geometry which will allow more destructive or constructive environments (or objects and particle systems).

"AA" AIN'T ANTI-AIRCRAFT

One of the most immediate things noticed when firing up the GeForce 8800 GTX is the new method of anti-aliasing. For the first time in a long while, a new method of AA has been developed to increase performance and image quality beyond the increasing of the sample size when doing the computations. The new method of AA is dubbed Coverage Sample Anti-Aliasing (CSAA) and uses a mixture of coverage samples and geometry samples to create the new map.

Nvidia has bumped up the CSAA settings to 16x, with new "Q" high-quality settings per sample as well, and with the new highest available in the toolbar at 16xQ CSAA. The company claims similar performance to 4x multisampling AA with 16xQ CSAA, and our testing supports that, but what we can't show you in pictures effectively is the increase in image quality it brings. The Nvidia control panel can override the AA settings in modern games and apply the CSAA to improve picture quality. It looks great.

Hand in hand with that is a new algorithm for anisotropic filtering (AF). "Angular LOD Texture Filtering" gives greatly improved AF effects, increasing realism where sharply angled textures or receding viewpoints occur.

THE MYTH, THE PRODUCT

So putting all of this together, Nvidia ended up with the 8800 GTX. A 128-scalar processor, 768MB-loaded graphics card with a thirst for 165 watts of power. The second model, the 8800 GTS, has a cut-down 96 processor and 640MB spec.

We installed an 8800 GTX in an Nvidia 680i motherboard with an Intel Core 2 Quad QX6700 CPU and two gigabytes of DDR2-9136 (1,142MHz) Corsair memory. We installed Windows XP SP2 on a WD Raptor 10,000rpm hard disk drive with the latest (beta) drivers.

As always, first off the bat was a 3DMark06 run. At default settings, the GeForce 8800 GTX card scored a whopping 11,840. In perspective, this single-card score is over the previous Labs record of 10,111 by a X1900XT CrossFire setup during our "Extreme PC" issue in October 2006. Of course, the X1950XTX has surpassed this score since. You might think this kind of performance out of a single card must mean even more devastating results out of an SLI setup — and you'd be right. We added another 8800 GTX to the mix and earned a score of 14,310 at default 3DMark06 settings. The lack of extra performance (only a 30-odd

BENCHMARK	SETTING	RESULT
3DMark06	Default	11,840
3DMark06	SLI	14,310
PCMark05	Default	7,793
PCMark05	SLI	7,930
Quake 4	1,280 x 1,024 16x AA 8x AF	137fps
Quake 4	1,600 x 1,200 16x AA 8x AF	70fps
Half-Life 2 Test 1	1,280 x 1,024 16x AA 8x AF	153fps
Half-Life 2 Test 2	1,280 x 1,024 16x AA 8x AF	155fps
Half-Life 2 Test 3	1,280 x 1,024 16x AA 8x AF	129fps
Half-Life 2 Test 1	1,600 x 1,200 16x AA 8x AF	118fps
Half-Life 2 Test 2	1,600 x 1,200 16x AA 8x AF	91fps
Half-Life 2 Test 3	1,600 x 1,200 16x AA 8x AF	90fps
Half-Life 2 Test 1	2,560 x 1,600 16x AA 8x AF	52fps
Half-Life 2 Test 2	2,560 x 1,600 16x AA 8x AF	52fps
Half-Life 2 Test 3	2,560 x 1,600 16x AA 8x AF	42fps
HL2: Lost Coast	1,280 x 1,024 16x AA 8x AF HDR	115fps
HL2: Lost Coast	1,600 x 1,200 16x AA 8x AF HDR	85fps
HL2: Lost Coast	2,560 x 1,600 16x AA 8x AF HDR	40fps
Prey	1,280 x 1,024 16x AA 8x AF	68fps
Prey	1,600 x 1,200 16x AA 8x AF	50fps

per cent speed increase for an additional card) can be explained by the CPU limitations at these kind of resolutions — the CPU can't keep up with the graphics. PCMark clocked the system (at stock speed) at 7,793 and 7,930 in SLI.

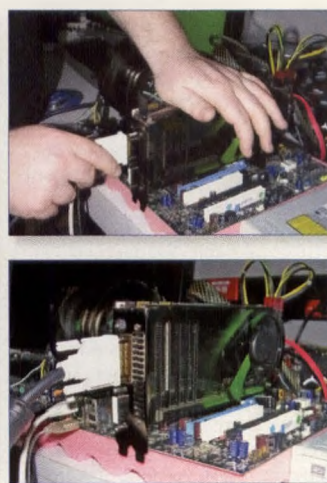
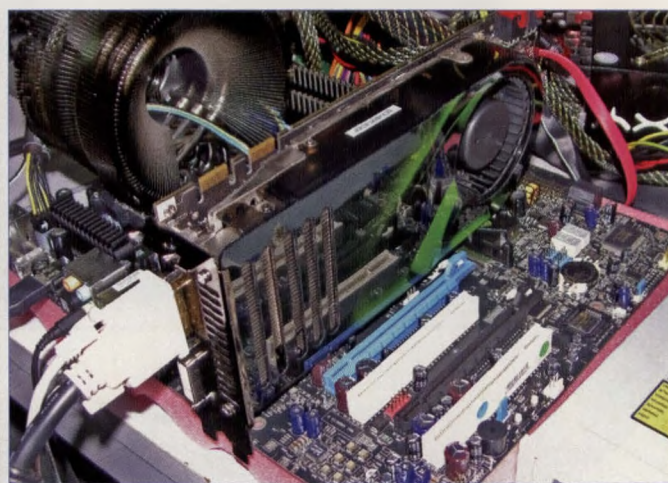
Before we could embark on further SLI testing, our second 8800 GTX card was recalled by Nvidia for a slight resistor adjustment, so we couldn't complete all the tests we'd hoped for. Stay tuned to the APC web site (www.apcmag.com) for

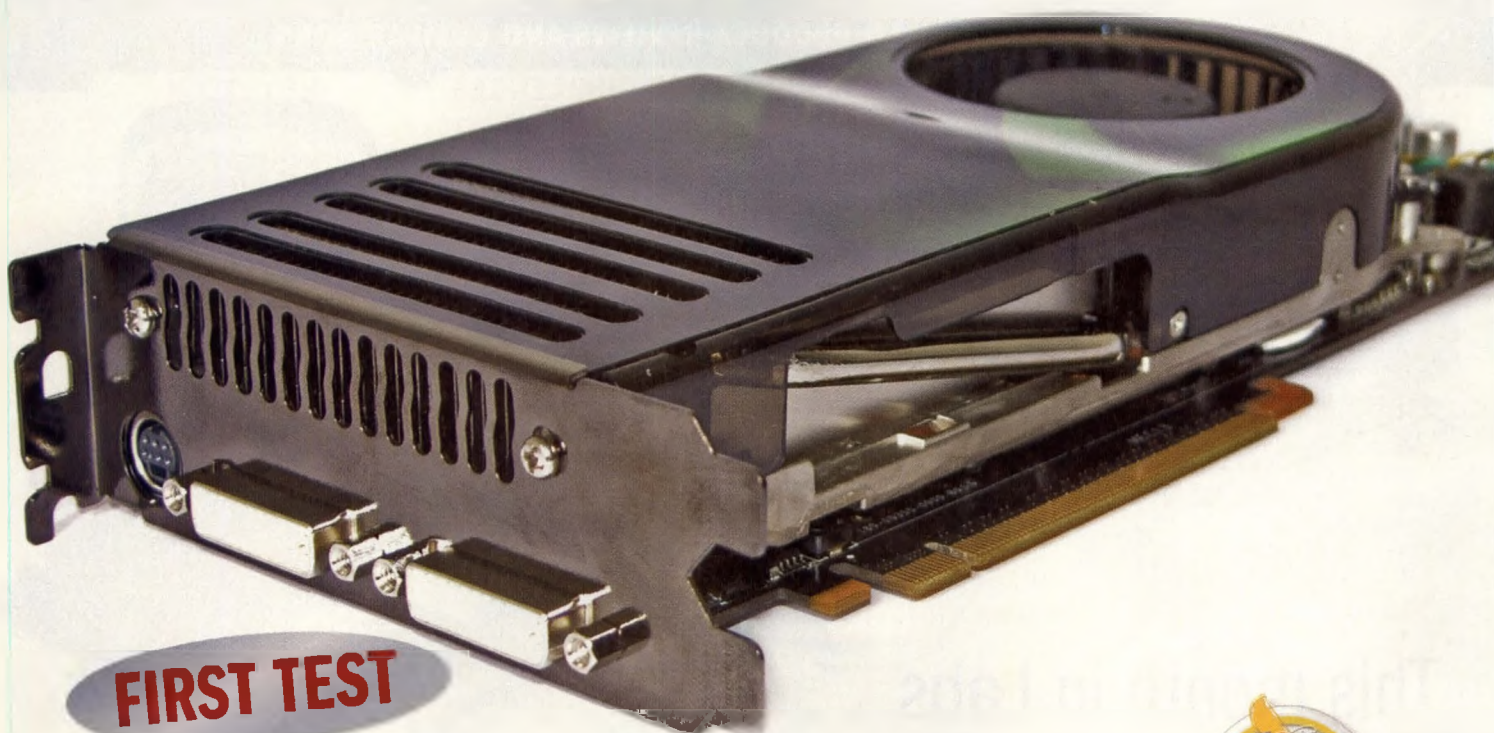
more in-depth SLI testing. Also, check out the table above for game benchmarks at various resolutions.

What's it all add up to? The 8800 GTX is indisputably the fastest graphics solution available for the PC. The support for DirectX 10 and next-generation graphics means you're future-proofed to some extent. The reality is, though, at lower resolutions (below 1,920 x 1,440 at a minimum) you're not going to get any speed up, as you're primarily limited by the speed of the CPU. The upside is, those lucky enough to have 30in monitors running at 2,560 x 1,600 resolution can run current-generation games with all the eye candy they want at full speed. **APC**



THE 8800 IS A THROUGH-AND-THROUGH DIRECTX 10 IMPLEMENTATION, WITH THE NECESSARY STANDARDS MET FOR FULL COMPATIBILITY



**FIRST TEST**

Nvidia GeForce 8800 GTX



Nick Race takes a look at Nvidia's new flagship.

Up there with Intel vs AMD and Mac vs PC, Nvidia vs ATI is one of the classic battles of current-day computing. The recent generation of discrete graphics adaptors has been see-sawing between the red team (ATI) and the green team (Nvidia) in terms of the performance crown. First it was the GeForce 6800 series taking one over the Radeon X800 cards, then a too-close-to-call scenario with the GeForce 7800s and the Radeon X1800, before a swing in ATI's direction with the top-of-the-line X1950 CrossFire solutions over the GeForce 7950 GX2 setups.

November saw some shots fired in anger from Nvidia and, this time, they hit the mark. The release of the GeForce 8800 series cards, the 8800 GTX at the top end and a cheaper 8800 GTS model, has seen the battle move decisively on to Nvidia's terms. So, what is this new weapon in the graphics war and what does it do?

MEGA-MULTI-CORE

Nvidia calls it the "World's First Unified DirectX 10 GPU Delivering Unparalleled Performance and Image Quality", or the "Definitive Gaming Platform" for the

• CONTACT	Nvidia
• PHONE	N/A
• ONLINE	www.nvidia.com
• MARKET	Performance enthusiast
• PRICE	From \$930

uninitiated. What it means is Nvidia's new 8800 series supports DirectX 10, the new framework for 3D graphics and acceleration in Microsoft's Vista (and a core requirement for next-gen games).

How they've done this is tidy. The 8800 GTX core consists of 128 parallel scalar stream processors running at 1.35GHz. It's unified in that any of the processors can be assigned to work on vertex, pixel, geometry or physics calculations as needed. This offers benefits where some applications are more heavily dependent on vertex shading rather than pixel shading, or vice versa. What usually happens is that large parts of the system wait around for another portion of the pipeline to finish its task — an inefficient way of doing business. Added to this, vertex shaders tend to be half the size of pixel shaders, meaning even larger portions of the chip are idle during geometry-heavy work. The

✓ Fastest solution available; DirectX 10 support.

• VERDICT ★★★★★

✗ Hot enough to use as a BBQ.

new model allocates processors to perform vertex or pixel operations as needed, so there's less waiting and more efficient use of the silicon.

Another new feature of the 8800 is its ability to create geometry on chip. Though this sounds like a fairly basic requirement, considering 3D graphics is based around geometry, it's the first implementation where the card can create the geometry itself. For practical purposes, this allows 3D programmers to create basic models, then instruct the card to generate multiple copies (instancing) of a geometric shape and treat it as any other. This means objects in games can become more complex: a prime example would be the individual rendering of leaves on trees (or trees themselves) with real attributes, instead of pixel shaders "faking it" as it's done now. This will create much more realistic 3D environments that can act and react much more realistically.

Perhaps even more interesting, the 8800 chip can also act as a GPGPU (or general-purpose graphics processing unit). It's capable of working on other (not necessarily graphics-related) tasks that benefit from heavy floating point performance.

The first to come to mind, and first implemented, is physics — a potentially very important technology for games. Nvidia has created a standard model for physics processing in the 8800 called CUDA. CUDA has been announced and released with a plain C compiler, allowing physics researchers and finance sectors go to town with this relatively inexpensive and very high-performance floating point unit. The interesting part is the crossover into games, where Nvidia demonstrated some "next-gen" titles (due out 2007) that use accurate physics models for smoke and weather effects.

The 8800 is a through-and-through DirectX 10 implementation, with the necessary standards met for full DirectX 10 compatibility, as well as Shader Model 4.0. Check out APC next month for our look at



This month in Labs... Water-cooling or bust

As the new year rolls around, it's time to take stock and set some resolutions for the next twelve months. In the Labs, that mainly involves us promising ourselves we'll keep things tidier, try not to lose track of the oodles of review product that piles up, and do the best damn job we can.

That said, I want to hear from you. What we include in APC and how it's covered is a constant and ongoing discussion around the editorial tables — what's the next big thing, what's the current big thing and how do we sort the wheat from the chaff? That's where you come in.

If there's a technology or product that you are eager to know about, let me know at nrace@apc

magazines.com.au. If there's a category of product or a brand you feel we've neglected, let me know! After all, we write this magazine for you, not ourselves. There's a quarter of a million people that read APC each month, and I'm willing to get an email from each and every one of you (even if I never sleep again!) if it's going to make APC a better, more informative and more entertaining magazine.

With the new year comes summer — and this one is going to be a doozy. Now that we've fought through the winter with the colds and flus, it's time to battle an even more insidious affliction — CCS (or Crashing Computer Syndrome). Every year, my western-facing PC room at the front of the house

warms up in the afternoon and when the ambient temperature hits a critical point — down goes the PC. There's the usual fix of opening up the case and directing a fan into the guts, but it's noisy, impractical and an eyesore. This year, I've had enough. It's not practical to install air conditioning for my PC room and I can't justify a refrigerated PC case or CPU cooler, so I've gone to the next best thing. An inexpensive water-cooling kit with a big, slow fan for the noise and plenty of surface area in the interchange. It can't work miracles, so it won't drop below the ambient temperature in the room, but there's a better chance that the PC can be kept closer to ambient and actually run on hot afternoons.

Say "No!" to CCS this summer. Last month, I talked about the rising heat in the next generations of PCs. It's coming true even faster than I thought. If you're the type to spend thousands on the latest and greatest, some quick maths will tell us that clearing the heat from a quad-core CPU and SLI GeForce 8800GTXs is going to run to 460 watts of waste heat. **APC**



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NICK RACE — TECHNICAL EDITOR



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Darkhttpd 1.3

A simple HTTP web server that even a child (raised on Linux) could use.

Darkhttpd's slogan, "When you need an httpd in a hurry", accurately sums up what Darkhttpd is all about. There's no setting files to be modified or hordes of options meticulously tweaked and configured; it doesn't even need to be installed. Just compile (type: make linux) and run it (type: ./darkhttpd <your www directory>).

It has a small memory footprint but is only single-threaded, which some may say is actually a good thing for a small web server (and it can only serve static content). Nonetheless, it has some good features. For example, it supports partial content (ie. resuming a broken download) and keep-alive connections.

CONTACT	Emil Mikulic
PHONE	N/A
ONLINE	http://dmr.ath.cx/net/darkhttpd/
MARKET	Advanced users
PRICE	Free

✓ Speed; memory usage; convenience.

VERDICT ★★★★★

✗ Not suitable for heavy, real-world use.

It can log accesses, with referrer and user-agent, time out connections, chroot for extra security, add mime types and also drop requests.

With no GUI, Darkhttpd can only be controlled through the console. Nevertheless, even the most inexperienced users should find it intuitive. To change to a different port, for example, specify the port number as a parameter (eg. — port 1021); to change the amount of simultaneous connections allowed use maxconn (eg. — maxconn 5); or to log events use the log parameter (— log server.log).

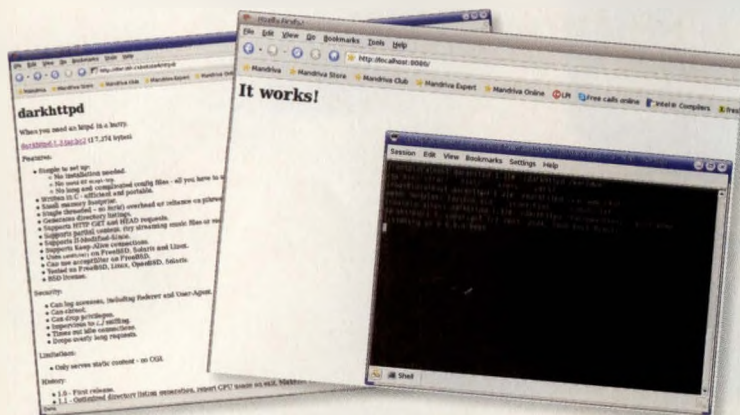
The Netcraft July 2006 Web Server Survey reveals that Apache

has a market share of 63.25%. Microsoft (IIS and PWS) comes in second on 29.91%. Zeus and Sun (Sun ONE, iPlanet Enterprise etc.) hold the third and the fourth positions, respectively.

Although Apache is a great open source web server, we are still excited to see what other developers have to offer the market. In fact, there are some web servers, like Lighttpd, that are pretty darn excellent.

Darkhttpd is not a replacement for Apache — it will never be. But it can be used if you urgently need to host a couple of HTML pages. If that's the case, it can save you a fair bit of time and effort.

Peter Sbarski



Sylpheed-Claws 2.5.2

A powerful email client for the masses.

Sylpheed-Claws is an efficient, flexible and feature-rich email client and news reader. It is one of those programs that should be shown to all Outlook and Entourage users (why do they still bother?).

Sylpheed-Claws has just about everything one might need in an email client including multiple accounts, filtering, SSL over POP3/SMTP/NNTP, GnuPG, address book, customisable toolbars, automated email checking and so on. Granted, these are basic features, but what about plug-ins, customisable actions, email templates, themes, per-folder processing mechanisms, automatic harvesting of addresses, colouration of messages and anti-phishing URL checks? These are just the tip of the iceberg, too. You can check out the remaining twenty or thirty features at www.sylpheed-claws.net/features.php.

Disregarding all the cool things like plug-ins and templates, Sylpheed-Claws is a very capable email client. It's possible to mount a case that filtering isn't very intuitive, but it's a small gripe. Sylpheed-Claws also doesn't have an inbuilt journal, a proper calendar or a to-do list, but these don't seem like a big loss. Overall, the feature trade-off is in Sylpheed's favour.

Plug-ins deserve a special mention. The SpamAssassin plug-in enables the scanning of emails from POP, IMAP or LOCAL accounts for spam. The Clam AntiVirus plug-in checks attachments for viruses; AcpiNotifier makes LEDs flash

on some notebooks on new email; and the etpan! Privacy plug-in handles signature verification and message decryption. There is also the Gtkhtml2 viewer which renders HTML in messages using gtkhtml2 and a perl plug-in which extends the filtering capabilities of Sylpheed-Claws even further.

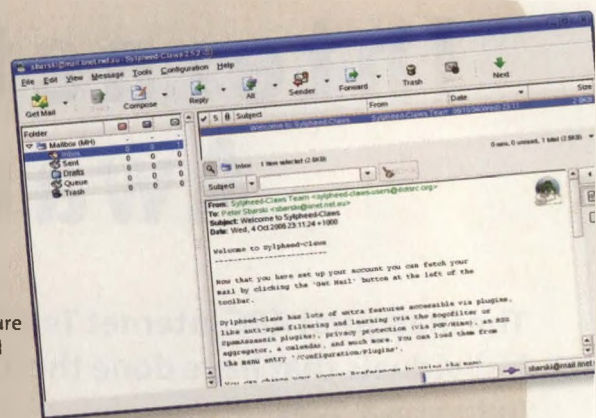
"Actions" is an interesting feature which launches external commands in conjunction with the email message. For example, you can build an action that

CONTACT	N/A
PHONE	N/A
ONLINE	www.sylpheed-claws.net/
MARKET	Everyone
PRICE	Free

✓ A great bevy of features; good stability and speed.

VERDICT ★★★★★

✗ No HTML email authoring; no calendar or journal.



You can configure Sylpheed-Claws to meet your every need.

automatically searches Google for the selected text, fixes a missing date, checks spelling or reports something as spam. Themes are nice but not as impressive as everything else. They mainly change icons.

Sylpheed-Claws 2.5.2 is a powerful but nimble email client that can be used by anyone and everyone — from beginners to professionals.

Peter Sbarski



trendmicro.com.au

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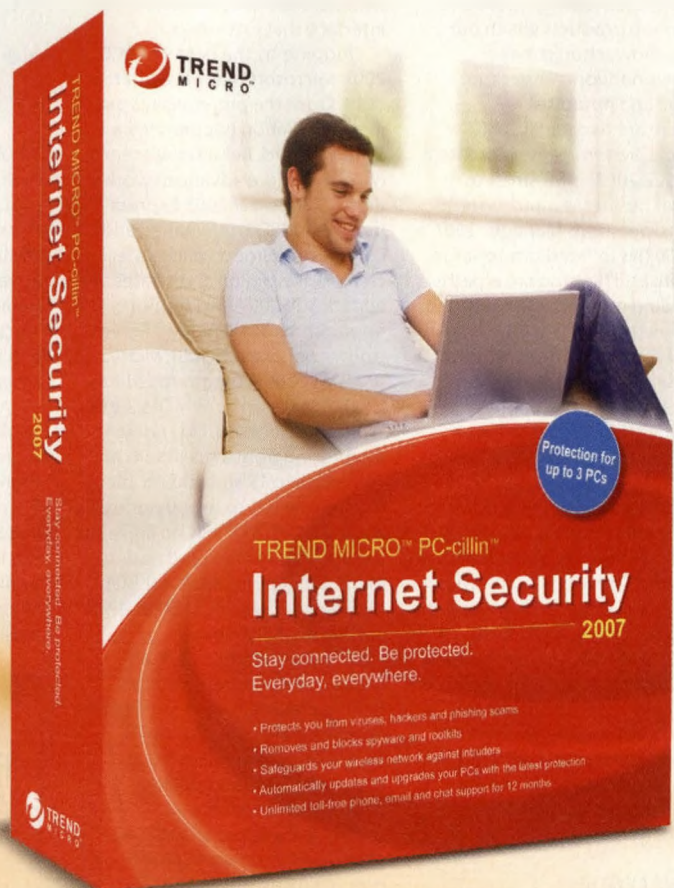


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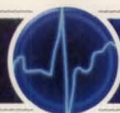
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System Center Essentials 2007 & System Center Operations Manager 2007

Microsoft is about to release two product families designed to make Windows networks easier to manage — one for small businesses and one for enterprises. *Paul Schnackenburg* assesses them to see if they're a match made in heaven.

Administering and supervising your IT infrastructure is about to become a whole lot easier, whether you're a small or large business. Microsoft is readying new and upgraded management and monitoring products which our testing shows should make Windows networks easier to manage and optimise.

There are two families of products. System Center Essentials 2007 (SCE 2007) is for small-to-medium businesses, and System Center Operations Manager 2007 (OM 2007) is for medium-to-large enterprises. They also cross paths depending on the deployment, so one could be forgiven for mistaking one for the other. These products are clearly twins; it's just their target audience that's different.

SCE 2007 and OM 2007 are important releases because management and monitoring is critical if you're running IT infrastructure. It gives operators an instant overview of the health of the entire IT network and the ability to drill down to particular problems on a specific managed node.

Fundamentally, a management server collects event logs and performance data from agents on managed servers, clients and network devices. This data is stored in a database and accessed via a console interface where it's then analysed.

SYSTEM CENTER ESSENTIALS 2007

Monitoring in small and mid-sized businesses is different to that in large enterprises. There's not usually an expert dedicated to

implementing and working with a management system; instead, this task falls on one or more IT generalists. These professionals need a tool that's easy to set up, with a simple but powerful interface that just works.

Judging by the beta 2 of SCE 2007, Microsoft may have got this right. Once the prerequisites are met, installation happens via a simple wizard. Behind the scenes, of course, more advanced work is done: SQL Server 2005 Express (formerly MSDE) is installed and configured, Group Policies are created and digital certificates are added. SCE 2007 also supports upgrading from Windows Server Update Services (WSUS), MOM 2005 or MOM 2005 Workgroup Edition.

SCE 2007 replaces MOM 2005 Workgroup Edition, extending the monitoring from a maximum of 10 servers to 15 and adding client monitoring for up to 500 nodes. By contrast, OM 2007 has no limits on the number of managed nodes. Minimum requirements for SCE 2007 are a 2GHz CPU, 1GB of RAM and 15GB of disk space.

SCE 2007 works in a multi-domain environment and can manage nodes in any trusted AD domain. It also uses Windows Server Update Services 3.0 for patching of a wide selection of Microsoft products.

Software deployment is also supported, both for Microsoft and non-Microsoft applications. This works for both .exe-based setup programs and .msi installers.

"There can only be one console, Highlander."

INSIDE INFO

- The MOM community
www.microsoft.com/technet/community/en-us/mom/default.aspx
- System Center Operations Manager 2007 home
www.microsoft.com/mom/evaluation/beta/opsmgroverview.aspx
- System Center Essentials 2007 home
www.microsoft.com/systemcenter/sce/default.aspx

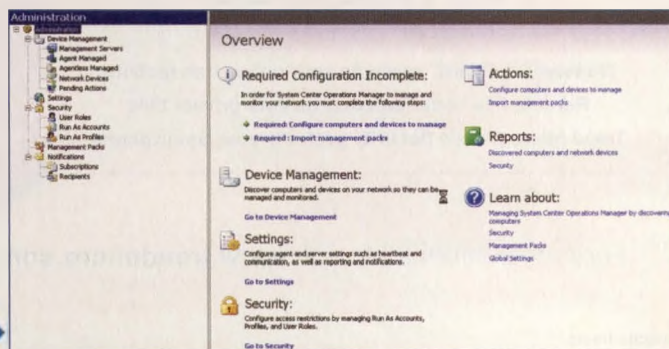
Troubleshooting problems is one of the big time consumers for IT professionals. SCE 2007 comes with the same management packs as in OM 2007 (albeit with some of the advanced features turned off by default), so help is only a click away. Tracking hardware assets, as well as software licences, is easy with built-in reports.

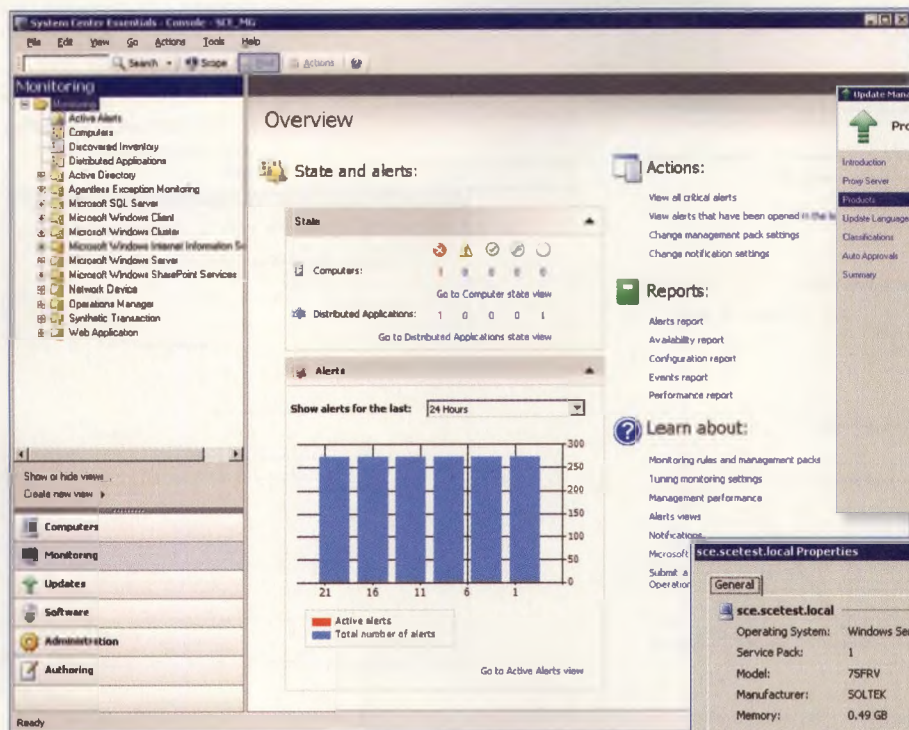
A feature not found in SCE 2007 (but available in OM 2007) is granular control over security; there's just the Administrator role. There's no Connector Framework to link SCE to other monitoring tools; nor is historical data warehousing available. Finally, there's no agent failover mechanism for high availability; nor are Audit Collection

Services present. But, adding software and patch deployment, as well as remote control of nodes, makes this a very appealing integrated management solution.

Since many small businesses have minimal in-house IT staff, they often rely on outside IT consultants. Many SMB consultants have turned to third party management tools to offer real-time monitoring to their clients.

Whilst often very capable, these tools do not have the in-house advantage of the knowledge contained in Microsoft management packs. Often they also require a permanent VPN connection between the client's site and the consultant's office —





The not-so-little sibling, System Center Essentials 2007.

Easily view vital statistics for each managed node.

something that's not ideal for security and performance reasons.

With SCE 2007 installed at each client's location and with OM 2007 at the consultant's site, there's now a compelling alternative for SMB consultants. This is made possible through the Service Provider management pack installed on the OM 2007 side. Each SCE installation is configured to use an SSL connection to check the heartbeat and report back to the OM 2007 server over the internet.

This makes the VPN requirement redundant and should provide better performance. OM 2007 is also site-aware, so each client's network is reported on separately. With WSUS 3 at the consultant's site, patch distribution is also controlled centrally for all clients, again providing greater control.

Finally, a set of SMB reports is provided, as it can often be difficult for a remote management solution to show value. These reports include data such as availability, top problems and time spent working on problems.

"Small businesses need monitoring just like the big boys in the enterprise end of town," says Stuart Applegate, general manager

of Business Computer Australia in Brisbane. "OM 2007, coupled with SCE at the client is the right path, but the released product needs to be SMB-friendly, with low training and support costs". Stuart also lays the onus on Microsoft to "educate SMBs on the importance of monitoring and maintenance".

Dean Calvert, principal consultant at Calvert Technologies says: "Monitoring of networks has been an important process for many years — it's just that many resellers and end users appear to not know this."

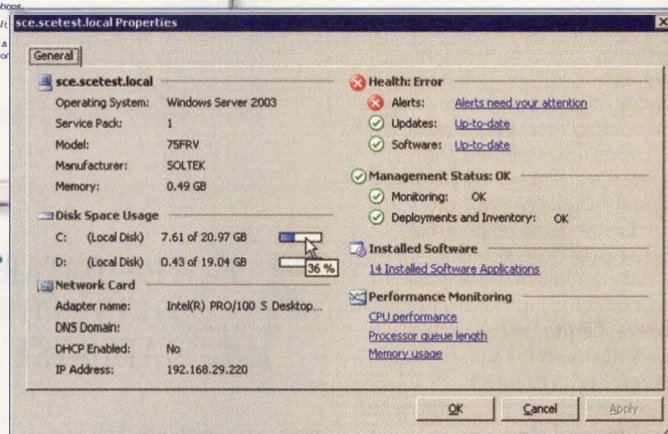
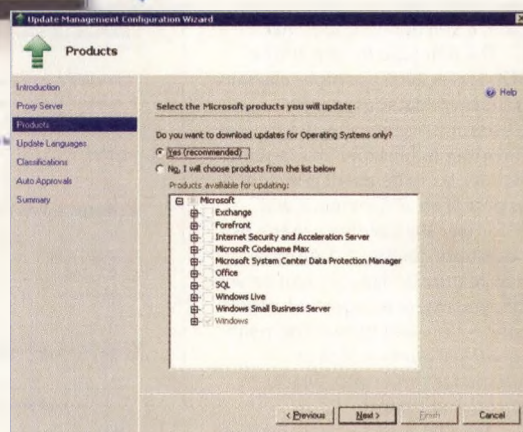
"We have found the email status reports offered by Small Business Server 2003 to be a nice marketing feature to clients; however, they really don't provide us with the level of information we want; nor are they 'real-time' enough."

Dean's company provides real-time monitoring to its clients today using Virtual System Administrator from Kaseya.



SCE 2007 AND OM 2007 ARE IMPORTANT RELEASES BECAUSE MANAGEMENT AND MONITORING IS CRITICAL

SCE includes all-round patching so that it's truly your "one stop shop" for management.



SYSTEM CENTER OPERATIONS MANAGER 2007

System Center Operations Manager 2007, generally referred to as OM 2007, is for the big boys. It includes the actual Operations Manager 2007 (formerly Microsoft Operations Manager, MOM), as well as System Center Configuration Manager (SMS 4), System Center "Service Desk" (helpdesk) and System Center Data Protection Manager 2.

Minimum hardware requirements for the server components are a 2GHz CPU, 2GB of RAM and 1-10GB of disk space (depending on components), plus database space. In larger environments, of course, these figures have to be scaled up considerably. Other necessary

components are .NET Framework 2.0, WinFX Runtime, Windows PowerShell and SQL Server 2005.

In MOM 2005 there were two consoles: one for administration of MOM itself, installation of management packs and other configuration tasks. The other was for the actual monitoring. OM 2007 combines these into one interface. Overall, the user interface in OM 2007 is much cleaner than in MOM 2005, making it easier to do tasks.

In MOM 2005 there was no easy way of granting individual administrators different access to consoles and data. OM 2007 introduces role-based security based on Active Directory groups, with choices such as Advanced Operator, Authors, Operators and Read-only Operators. This also

means there's no need to keep group membership in local groups on the management server up to date; it's all done through AD.

The database for OM 2007 is SQL Server 2005; for high reliability it supports database server clustering. Agents now use Active Directory to find their management servers, so, if the agent is included as part of an SOE image, it will automatically become a managed node upon joining AD. Another new feature is management server failover, where an agent who loses connection with its management server will query AD for an alternative server with which to communicate.

One of the coolest new features of OM 2007 is end-to-end service monitoring. This is a way of grouping Line of Business or in-house applications and their underlying hardware together and monitoring them as one object.

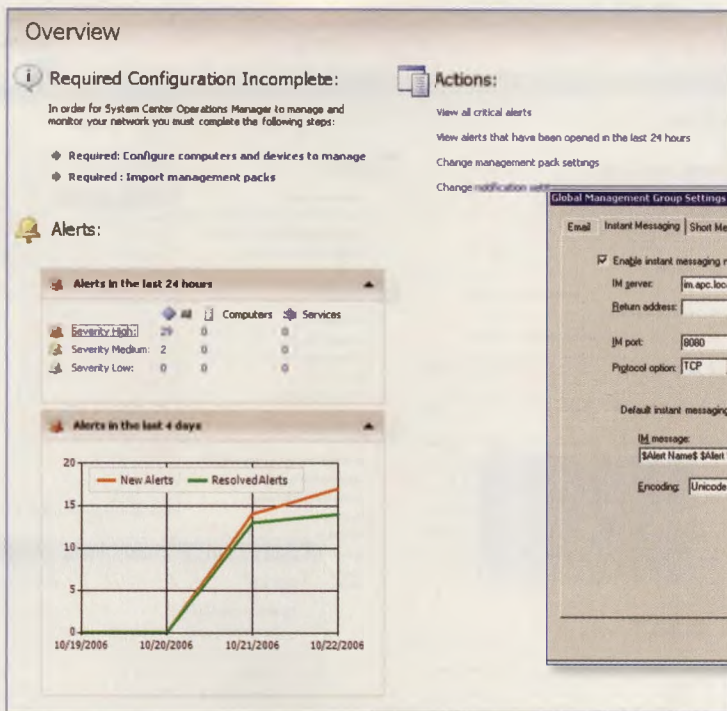
Using a SOAP-based XML language called System Definition Model (SDM), OM 2007 can "understand" the relationship between each component. A service defined in this way can be monitored just like any other device: performance can be tracked, events monitored and overall health checked.

In a diagram view, components can be added and their relationships defined with arrows. For testing purposes, synthetic transactions, acting like an end user, can be used to test the entire monitoring chain. The distributed application can also be linked to others where large, complex environments exist.

OM 2007 also extends monitoring to the client. While MOM 2005 could monitor select client PCs, there was a high Client Access Licence dollar cost, as well as system overheads to consider. The OM 2007 agent has a lower dollar cost per client (no exact figures yet), as well as less system impact.

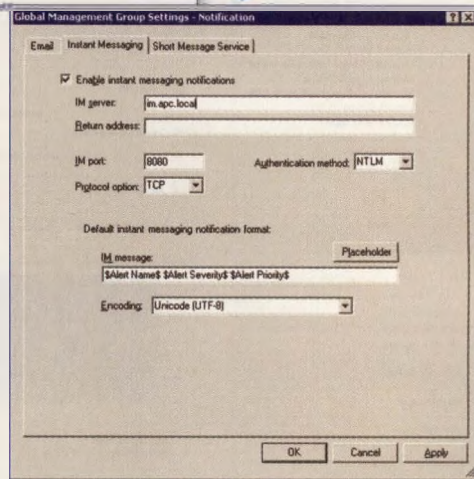
Management packs are now divided into core libraries that other management packs can build upon. There's also a new way of locking a management pack against unintended changes, called sealing. If you have custom or customised management packs in MOM 2005,

The diagram feature in OM 2007 is very handy for seeing the logical layout of your network.



Keep track of alerts across your network.

Let OM 2007 talk to you online when there's a problem.



THE DATABASE FOR OM 2007 IS SQL SERVER 2005; FOR HIGH RELIABILITY IT SUPPORTS DATABASE SERVER CLUSTERING

there are utilities (MP2XML and MPConvert) to convert these to the new XML-based format.

Microsoft is keen to point out that there are many third party management packs available for MOM / OM, including Unix Syslog redirection and Linux management. Native SNMP support is another

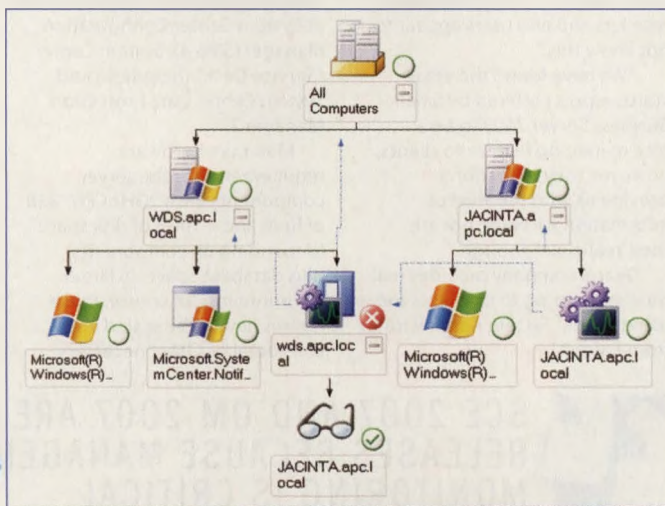
new feature, which should make it easier to monitor managed switches, routers and other network hardware. Notification of alerts and problems can be done through email, just as in MOM 2005.

New in OM 2007 is alerting through IM and SMS. The upgrade path from MOM 2005 has an

interesting twist, in that you can install and run the server components as well as the agents side by side. So, the same servers can function as both MOM 2005 and OM 2007 boxes, receiving data from agents on the same managed nodes. There's no downtime: when you're confident and happy that OM 2007 is doing its job, you can simply uninstall all MOM 2005 components.

In larger environments, OM 2007 can be run on separate servers but still alongside MOM 2005 (once again retiring the old servers when OM 2007 is working).

System Centre Operation Manager 2007 also includes a product for centralised security log storage in response to the Sarbanes-Oxley Act, which was introduced in response to the corporate and accounting scandals in the recent past, and which requires IT to facilitate better auditing processes and regulates tasks such as email and security log archiving. This is offered to select customers only. **ETC**

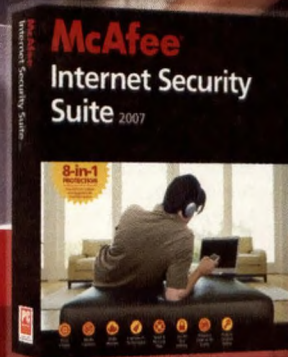


Bank account
personal information
security check
number, his driver's
even credit card
identity protection
life, accounts and

personal
security check
number, his driver's
even credit card
identity protection
life, accounts and
security breach, liability
prosecution identity
internet, hackers

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accounts compromised
for identity protection
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information hackers at
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identity

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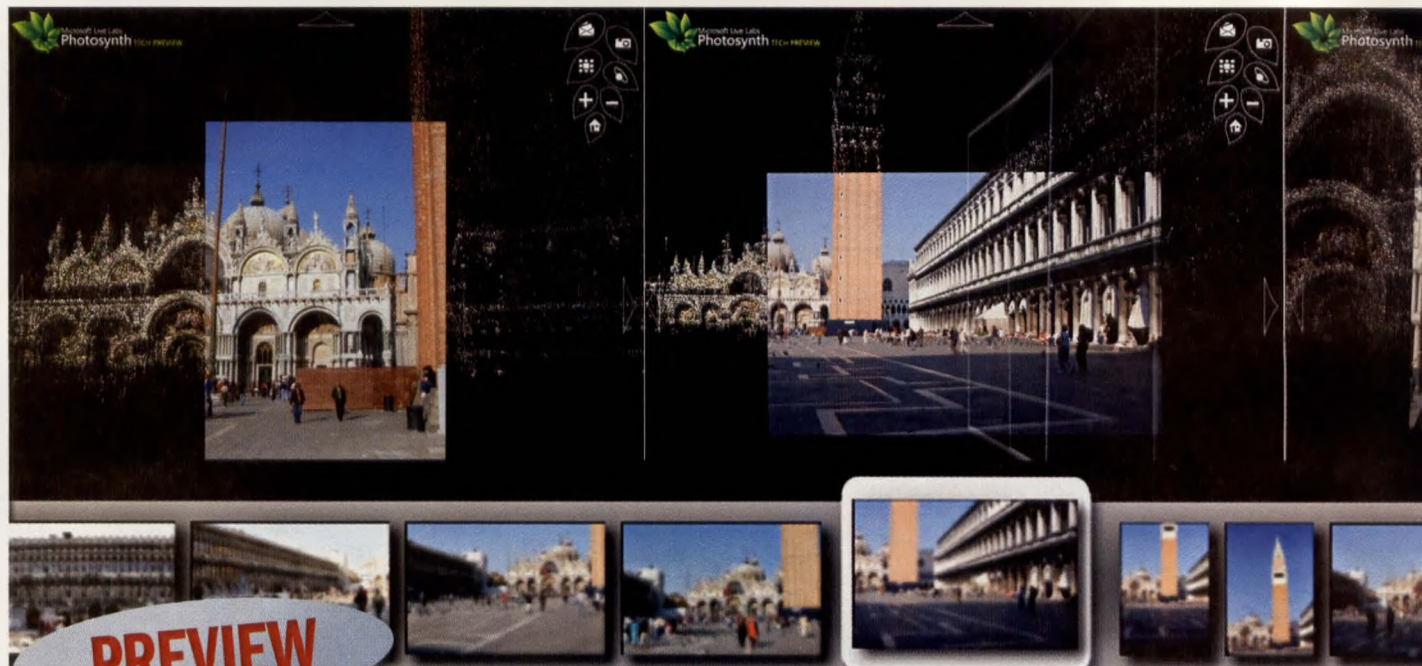


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PREVIEW

Graphic violence

Combine multiple images in Photosynth to produce a 3D map of where each was taken.

Microsoft is targeting Adobe with a new range of graphics formats and web design products — and is planning an amazing new photo album tool.

Back when the only people who seriously used image-editing packages were graphic designers, the market was easily dominated by one player: Adobe. So entrenched was its hold (and so specialised its market) that it didn't even bother taking the Windows versions of its applications seriously until the late 1990s.

Having eventually achieved feature-parity for PCs and Macs, Adobe managed to see off its major pure-design rival, Corel, and appeared poised to dominate the design world, such as it was. It then swallowed its longstanding rival in the web design space with its \$4.3 billion acquisition of Macromedia. Given the general view that Microsoft's FrontPage produced unpleasantly bloated code, the combination of Dreamweaver plus Photoshop looked like keeping Adobe dominant for a fair while longer in the web design space.

However, the rise of web site design and, even more tellingly, the unstoppable juggernaut of digital

camera usage means that the design market has become a whole lot bigger than it used to be. And wherever there's a mass market demanding software, there's a bunch of Microsoft executives sniffing around.

Microsoft finally got serious about taking on Photoshop's dominance in 2003, when it acquired (obscure) Hong Kong developer Creature House and released two previews of its Creature House-derived Photoshop rival, Acrylic, to generally approving murmurs. Now, in the US, Microsoft has finally released Acrylic (renamed Graphic Designer) as part of the new Microsoft Expression suite.

To go on sale in Australia shortly, the Expression suite is a full frontal attack on Adobe. It's a combination of graphics and web design tools to combat Adobe's suite of web designer products, which include Flash and now Dreamweaver.

The Microsoft Expression Suite contains three programs:

GRAPHIC DESIGNER

The descendant of the Acrylic program. This exports design elements to a variety of software tools and formats including the Windows Presentation Foundation (WPF), the graphical subsystem in Windows Vista that's an extension of the .NET Framework. Graphic Designer looks like a cross between Adobe's Illustrator and Photoshop, though early tests show it isn't as individually powerful as either of them.

INTERACTIVE DESIGNER

This is the Flash killer, formerly codenamed Sparkle. It's based on the WPF (which can display the output on the Vista desktop or in a browser) and Extensible Application Markup Language (XAML). It can create Flash-like "cinematic" interfaces by combining various media elements such as vectors, pixel images, 3D content, video and audio, high-quality text and animation. Microsoft is already enlisting

major content publishers to publish content to the WPF — and Interactive Designer will be the tool of choice for this.

EXPRESSION WEB

This is the replacement for FrontPage (Microsoft's universally derided web design program). Unlike its predecessor, Expression Web supports web standards, has powerful CSS page layout and formatting tools and is designed to strongly integrate web design with Microsoft development tools such as Visual Studio. It also has strong support for ASP.NET, XML and XHTML. But, predictably, it doesn't support non-ASP.NET platforms such as PHP. However, early testers rate it as a far superior product to FrontPage.

We'll bring you a full review of the Expression suite once the Australian version is available.

One potential challenge for both Microsoft and Adobe is convincing purchasers of digital cameras that it's worth upgrading

Look out Flash: Interactive Designer is on its way into your market share.



No more struggling with FrontPage: here is its replacement — Expression Web.

from the free software that comes with their cameras to a higher-priced commercial alternative. As constantly declining prices for prints attest, most digital camera owners are cheapskates at heart.

PHOTOSYNTH

This isn't stopping Microsoft from taking aim at Adobe's Photoshop Album programs (and Google's Picasa, among others), with a new technology that could make all digital photo albums obsolete the moment it's available commercially — it really is that extraordinary.

Called Photosynth, it's a program that takes a large collection of digital photos of a place or object, analyses them and reassembles them in a 3D space, showing you exactly where each was taken and how it relates to the other photos. You can already preview it by downloading a demo version from the Microsoft Photosynth site.

As an example, if you went to Parliament House, Canberra (or the great wall of China, or anywhere really) and took dozens of photos of the buildings or structures from various angles, Photosynth would create a background 3D image of the building based on the data in your photos. It then shows you, with graphic symbols (a point cloud or actual overlays of the photos themselves) where in the 3D space

each photo was actually taken from and lets you zoom in on the photo to view it at full resolution.

Photosynth does its magic by analysing each image and identifying characteristic features in each photo and then cross-matching them with those of other photos, in effect filling in the pieces of a 3D puzzle.

Photosynth is based on the groundbreaking research of Noah Snavely and Steven Seitz (from the Imaging Lab at the University of Washington) and Richard Szeliski (Microsoft Research).

Without putting too fine a point on it, we were blown away by the demo of Photosynth. It's easily the greatest advance in digital photo albums we've seen. According to information on the Microsoft Photosynth web site, the photos can have been taken by one person, or they can be a mixture of images from different cameras, shooting conditions and resolutions. "The algorithms behind Photosynth can figure out not only where the features are in 3D, but where all of the cameras would have to have been, and which way they were aimed, consistent with the features they 'saw'.

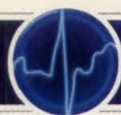
"The Photosynth client shows you the 3D point cloud, but, more importantly, it also shows you the original pictures overlaid on the model. Imagine a slide projector placed at each original camera

position, aimed how the camera was, and projecting the picture that camera took. A screen is placed in the 3D environment at an appropriate distance from the projector. As you move around in the Photosynth environment, projectors turn on and off, giving you a changing perspective on a world built entirely out of the original photos."

Currently, the Photosynth preview does not let you upload your own photos. It comes instead with pre-loaded sample albums — you can download it from the Photosynth site at <http://labs.live.com/photosynth/default.html>.

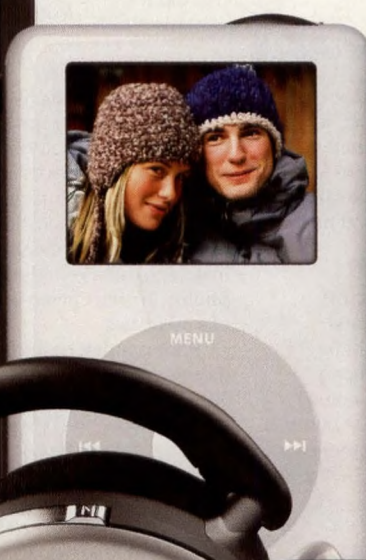
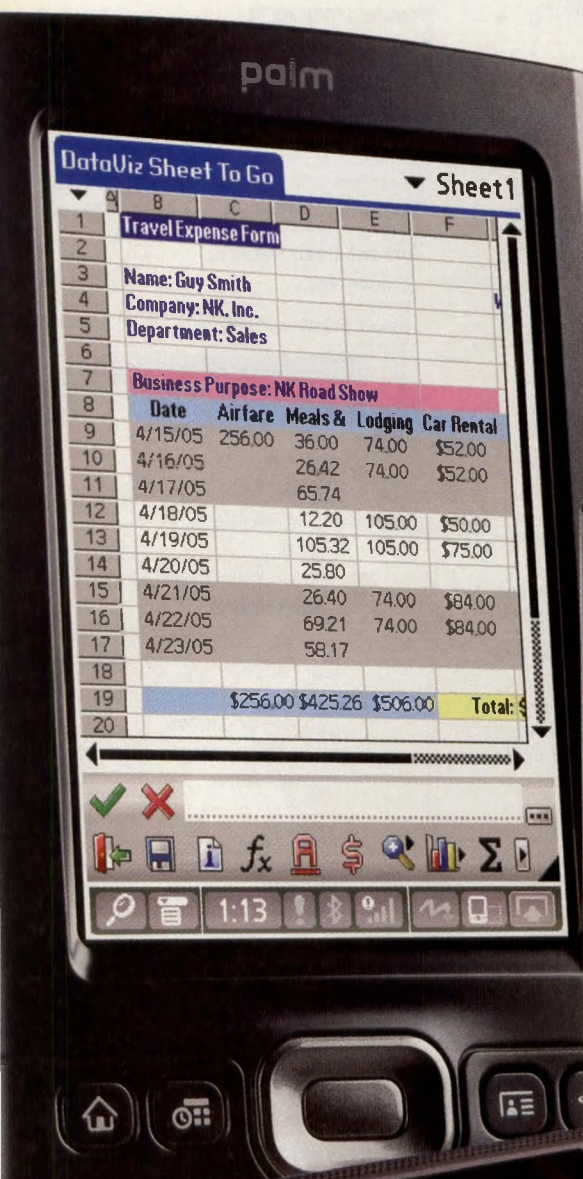
Microsoft says it's aiming to let users input their own photos as soon as it has overcome some last technical hurdles. "We're still learning what works and what doesn't with the recognition algorithms, improving them as we go. It's also very computationally intensive; the processing to build a collection can take hours or days at the moment. We're working on these issues, but we're not going to release anything until we're happy with the results. Please stay tuned to the blog for updates."

Like the other graphics products, Photosynth will work only on Vista (or XP with Service Pack 2). With Expression also sending content creators to the WPF platform, the battle with Adobe is about to get nasty.



Holiday gadgets

Holidays should be a time of fun and relaxation. For tech addicts, it can be a time of withdrawal and depression (if a net connection or a new gizmo to master isn't within reach). We take a look at the gear to help you get through the summer break.



BlackBerry 8707G

The most likely withdrawal pangs you'll get when away from your PC on a holiday will be for your email. If you like to compulsively scan your inbox every few seconds of the day, a BlackBerry is the device to pack. Also integrating a mobile phone and organiser, the BlackBerry is a favourite of business people who need to stay in touch at all times. It retrieves and sends email via normal 3G or GSM/GPRS mobile networks, which means that anywhere you can make mobile calls you can also get your email. The BlackBerry servers interact with any POP3 or IMAP mail server, so your email options are as varied as those on a PC, but unlike phones with built-in mail clients, the mail is compressed and then "pushed" to your BlackBerry rather than constantly being polled.

The newest BlackBerry, the 8707G, is the first model to use 3G wireless networks for net browsing

CONTACT	Optus
PHONE	1300 301 937
ONLINE	www.optus.com.au
MARKET	Everyone
PRICE	\$999 (\$600 with 2-yr \$79 plan)

and can be used as a laptop modem (though at present, no Australian carrier offers a plan that allows this). There are different versions of the BlackBerry depending on whether you use it with 2G or 3G networks, and a cornucopia of BlackBerry plans from the carriers. The BlackBerry also supports global roaming on standard mobile networks.

Although the BlackBerry's browser doesn't render net pages like a desktop web browser, it does enough to make the page readable. However, if the quality of web surfing is really important, go for the Nokia E61, which has many of the BlackBerry's functions but comes with a web browser that's essentially a cut-down version of

the Mac's Safari, using Apple's WebCore and JavascriptCore to render pages just as you'd see them on a PC (complete with mouse pointer and pan-and-scan window effect).

Nokia's Symbian Series 60 OS is an acquired taste though — it can be fiddly to navigate through. Otherwise, the BlackBerry does a perfect job of keeping you in touch with your geek side 24/7.



✓ The perfect mobile email centre; can be a laptop 3G modem.

VERDICT ★★★★★

✗ Expensive.



Samsung YP-Z5

The main advantage of the YP-Z5 is its amazingly long battery life, which is rated for up to 35 hours of continuous use. If you are going on a long trek, forget about bringing your iPod. This is the MP3 player that you need to carry.

The YP-Z5's sound quality is hard to fault. The audio produced by this player is clear and precise. Another advantage of the YP-Z5 is that it mounts as a removable drive so you can just copy and paste your favourite music files to it. It's quite liberating to finally not have to use iTunes or any other poorly made proprietary application in order to transfer your files.

The unit is 90mm high, 42.1mm wide and 11.4mm thick. It is thicker than the iPod nano but weighs only about 45 grams.

Unfortunately, the YP-Z5 is not without its problems. Its LCD looks inferior to that of the iPod, even though it is larger. The Tap Pad is fiddly and can sometimes be frustrating to control. It is very easy to skip past the track you're looking for. The user interface is similar to that of the iPod, so there's nothing too tricky to learn.

The YP-Z5 doesn't have an inbuilt radio or sound recorder. However, if all you are looking for is long battery life and good sound, this Samsung should be considered.

CONTACT	Samsung
PHONE	1300 369 600
ONLINE	www.samsung.com/au/
MARKET	Everyone
PRICE	\$319 (4GB)

✓ Superb battery life; great sound; mounts anywhere.

VERDICT ★★★★★

✗ Fiddly controls; no radio.





Telstra hiptop2

If you want to send and receive emails and instant messages, SMS and surf the web while not paying a fortune in data fees, the Telstra hiptop2 is the device for you. It's based on the T-Mobile Sidekick Communicator that's been such a hit in the US, a kind of BlackBerry for the masses that looks like a gaming console. Telstra has brought it to Australia, renamed it the hiptop2 and linked it to one of the best mobile data plans around, with unlimited data downloads for just \$30/m. Even if the catch is a two-year contract, it's a great deal for unlimited data on a mobile network. While the hiptop2 only uses the GSM/GPRS network, its 40Kbit/s download speeds are enough for email, SMS and basic browsing. It also comes with the MSN Messenger client, which is perfect for the always-on device. The reason the hiptop2 has proved extremely popular in the US —

particularly with teenagers — is that it is surprisingly feature-crammed and well-designed. With the dimensions of a small games device (133 x 66 x 22mm and 187 grams), it unfolds to reveal a bright 240 x 160 pixel, 65K pop-up display and a five-row QWERTY thumb keyboard. Its proprietary OS multitasks the in-built applications with ease, enabling users who are compulsive senders of SMS, IM and email messages to easily flick between each. Most reviewers have rated the keyboard one of the best ever for a device its size. The hiptop2 can be used as a phone as well, although the \$30 per month unlimited data plan does not include phone calls.

CONTACT	Telstra
PHONE	13 21 41
ONLINE	www.telstra.com.au
MARKET	Everyone
PRICE	\$589

✓ Great design; always on; excellent apps.

★ VERDICT ★★★★★

✗ Slow; only uses GSM/GPRS network.



Jabra BT620s

Music playback is now an almost standard feature on mobile phones and PDAs; however, audio jacks on these devices are almost as varied as their power connectors. If your gadgets have built-in Bluetooth and also support the A2DP protocol, you can dispense with carrying multiple headsets in favour of wireless headphones like the Jabra BT620s.

Using a wraparound, behind-the-head design, the BT620s headphones aren't much larger than a regular street-style pair. They are a bit heavier at 100g, though, and extended wear can get uncomfortable.

The silver earmuffs are conservative, but the flashing blue light on the left one is anything but discreet.

In addition to A2DP, the BT620s supports the AVRCP protocol; on Bluetooth-enabled phones that have this feature, you can rewind and skip through tracks using the right-hand playback controls.

It also supports simultaneous connections to a mobile phone and music player, so, if a call comes in while you're listening to music, it switches over to the mobile phone (so you can take the call using the BT620s' embedded microphone. This worked as advertised on our test devices, but after ending the call, connection to the music player needs to be manually re-established.



CONTACT	Jabra
PHONE	N/A
ONLINE	www.jabra.com.au
MARKET	Everyone
PRICE	\$179

✓ Good music quality; automatic call switching.

★ VERDICT ★★★★★

✗ A bit too heavy for extended use.

Next G

NETWORK

If handheld devices don't cut it and you need to access the net regularly from your notebook, your biggest challenge when on holidays is finding a usable broadband connection. Most resorts — even caravan parks — will probably offer dialup, but that's cruel and unjust punishment for anyone. The best alternative for accessing the net when you need to is mobile internet. There's a variety of mobile broadband networks but Telstra's just-launched Next G is clearly the best in terms of performance and

coverage (promises up to 98% nationwide coverage), if not cost. It uses an extension of the 3G standard that's able to deliver extremely fast broadband. As we pointed out in the last issue, Next G is actually a PCMCIA GlobeTrotter HSDPA card from a Belgian company. Using the Next G card, APC achieved connection speeds of 1.7Mbps, faster than many people's landline broadband connections. The card doesn't come in ExpressCard or USB versions, so make sure your

new laptop can accommodate PCMCIA cards. Next G can get very expensive with extensive use, however. Cheaper but still relatively fast options are the

CONTACT	Telstra BigPond
PHONE	13 12 82
ONLINE	www.bigpond.com.au
MARKET	Everyone
PRICE	Card: \$299 (plans from \$29)

384Kbit/s 3G network shared by Optus and Vodafone, or 3's mobile broadband network. We've used Vodafone's network regularly across the eastern seaboard and when it fails to connect at broadband speed, it falls back to the carrier's GPRS network, ensuring that, one way or another, you always stay connected.

✓	Promised 98% nationwide coverage.
VERDICT	★★★★☆
✗	No ExpressCard or USB version.



Creative ZEN Vision:M 30GB

The first thing that stands out about the ZEN Vision:M is its excellent 63.5mm screen full of wonderfully vivid colours.

Featuring a 320 x 240 resolution with 262,144 colours, as opposed to the iPod's 65,000, the ZEN's screen seems ideally suited for video, and it is.

The battery is rated to last for up to 14 hours of music listening or four hours of video playback.

This isn't too bad at all, considering the iPod 30GB is only rated to last for 3.5 hours of video.

CONTACT	Creative
PHONE	1300 788 528
ONLINE	http://au.creative.com/
MARKET	Everyone
PRICE	\$399.95

✓	Excellent features; beautiful screen; FM radio and mic.
VERDICT	★★★★☆
✗	Touchpad; included software is not the best.

Feature-wise, the ZEN Vision:M is far superior to many of its competitors.

It includes an inbuilt FM radio, the ability to synchronise with Outlook, a sound recorder with an inbuilt microphone and WMA, DivX and XviD support. It can also be used as a removable storage device.

Although the ZEN is heavier than a similar-specced iPod,

it's not too bad, weighing in at 163 grams. The vertical touch-sensitive pad and the buttons, however, are not as intuitive as iPod's click-wheel. The touch pad unfortunately seems a little too sensitive at times.

A few programs to transfer files and manage the unit are included in the package. The ZEN Vision:M is not perfect, but it does deserve broader recognition.

Canon PIXMA mini260 Photo Printer

The PIXMA mini260 is an excellent photo printer that allows users to print directly from memory cards or via PictBridge. Photographs can also be transmitted to the printer using infra-red or Bluetooth (via an optional BU-20 adaptor). The PIXMA mini260 can print a full borderless 6 x 4in photograph in fifty to sixty seconds. Quality is generally superb, although, in our testing, a couple of pictures came out slightly washed-out. This unit accepts a range of different papers, including glossy, semi-gloss and

matte. It can also print on stickers. The unit comes with a bright 2.5in LCD, which can be used to view/edit pictures and configure some settings. Direct editing features include red-eye correction and noise reduction. An iPod-like scroll wheel is used to control the unit, and overall it's intuitive and easy to use. The unit has a weight of

approx. 2.2kg (it comes with a handle) and measures 226 x 225 x 82 mm (W x D x H).

The mini260 can be connected to a PC like a normal printer via USB. This printer has a great design and produces good-quality prints. Unless you need something ultra-portable, don't go past it without having a look.

CONTACT	Canon
PHONE	1800 021 167
ONLINE	www.canon.com.au
MARKET	Everyone
PRICE	\$199

✓	Price; quality of prints; overall design.
VERDICT	★★★★☆
✗	Heavy weight.





Netgear Skype Wi-Fi phone SPH101

If you're off to Adelaide, San Francisco, Singapore or any of a growing number of cities which make available free Wi-Fi hotspots, consider something different: a Skype Wi-Fi phone. Find an open Wi-Fi hotspot and the phone will hook up to the net and put your calls through to other Skype users (or the standard telephone system if you're using the Skype Out service). The caveat is finding the hotspots.

Since the phone does not have a browser to enter login details, you can't use commercial Wi-Fi hotspot services such as the ones usually found at airports. However, most towns now have cafes that provide

open access and some cities are actually becoming free open hotspot zones. In partnership with telco Internode, Adelaide has launched open Wi-Fi access in several areas of the city and its new airport. San Francisco has a couple of consortia about to blanket the city and Silicon Valley with free access, while free hotspots are available throughout Asia and Europe. NETGEAR's Skype Wi-Fi Phone is ready to use out of the box with any free Wi-Fi network. Like a PC-based Skype client, its display shows which Skype users are online. The return on investment on the \$449 asking price is steep, though.

CONTACT	Netgear
PHONE	1300 361 069
ONLINE	www.netgear.com.au
MARKET	Everyone
PRICE	\$449

✓ Free phone calls in open Wi-Fi hotspots.

VERDICT ★★★★★

✗ Finding the hotspots.



Bose QuietComfort 2 Headphones

Holidays or travel are not necessarily noise free. You might land a seat just behind the engines, and then get to your favourite resort and realise you're in the room above the disco or kitchen. The reason we love technology so much is that it increasingly has a solution for most things. Bose's noise-cancelling headphones are a must-have travel accessory. APC news and web editor Dan Warne even uses them in the office sometimes to drown out the arguments between staff on the merits of some products. We're recommending the QuietComfort 2 headphones, which have been out for a while now. They work both actively, by cancelling unwanted noise electronically, and

passively, by shielding sound with humongous earcups that fully cover your ears. Bose has just released QuietComfort 3 headphones, which are designed to be less bulky and obtrusive, sitting on your ears rather than enveloping them. We haven't tested them yet, but overseas testers have claimed they are not as effective as the QuietComfort 2 phones because of their smaller earcups, although they are more elegant, particularly

when used as standard headphones. Bose reckons the new design gives similar results without being so bulky as the previous version.



CONTACT	Bose
PHONE	13 36 22
ONLINE	www.bose.com
MARKET	Everyone
PRICE	\$499

✓ They actually do cancel noise.

VERDICT ★★★★★

✗ Bulky.



LaCie Rugged All-Terrain Hard Drive

Marketed as having a "superior product design", the look of LaCie's Rugged All-Terrain Hard Drive is underwhelming and disappointing. One can't help but feel that there must be something more to it than the orange rubber bumper and the generic metallic look of the aluminum shell.

The unit is quite light at 250 grams, although it is still heavier than the other two drives in this roundup. It seems quite durable. According to the manufacturer, the maximum drop height is 90cm in non-operating mode.

The 100GB model (approx. 93.1GB formatted) features a 7,200rpm hard drive with an average seek-time of less than 12 milliseconds. It is fast; very fast. Therefore, it is not surprising that it makes mincemeat out of the other two 5,400rpm drives in this guide.

The unit has three ports including FireWire 800, FireWire 400 and USB 2.0, plus an extra socket for a USB power-sharing cable. The inclusion of all of these ports must be applauded. Take note, other manufacturers: providing just USB is lazy.

LaCie "1-Click" backup software for Windows and Mac is included, as is SilverKeeper automatic backup/file verification software for Mac and FireWire/USB cables.

CONTACT	LaCie
PHONE	(02) 9669 6900
ONLINE	www.lacie.com/au/
MARKET	Everyone
PRICE	\$329

✓ Triple interface; rubber bumper; disk speed.

.. VERDICT ★★★★★

✗ Hype; price.



Toshiba Gigabeat S

Reminiscent of an old-school cassette player, the Gigabeat S has a boxy shape and playback buttons on one side. However, this is the only throwback to analogue that you get on this otherwise modern music player. Music, photos, movies and FM radio are all included and, like the Creative, it supports direct connection to a digital camera.

If you've used the Media Center version of Windows XP

before, the Gigabeat S's menu system will be instantly recognisable. The good news is that it translates extremely well to a portable player, with a dedicated Windows button for going back to the Start screen and a crosshair arrangement of mechanical buttons for quickly browsing through your media library.

The Gigabeat S' screen uses a portrait layout, making it look larger

than its 2.4in size. It's not as bright or vibrant as other displays we've seen, but watching movies in landscape orientation (by turning the player on its side) is still an enjoyable experience. Videos encoded in the WMV format are natively supported — other popular formats like DivX and MPEG-4 are automatically encoded by Windows Media Player on your PC.

Twelve hours of audio and 2.5 hours of video playback is low and the battery isn't replaceable. On the plus side, Toshiba doesn't skimp on accessories, with an AC charger, earphones, mini-USB cable and A/V cables in the box.

CONTACT	Toshiba
PHONE	13 30 70
ONLINE	www.isd.toshiba.com.au
MARKET	Everyone
PRICE	\$479 (60GB)

✓ Music, movies, photos, camera and backup all in one.

.. VERDICT ★★★★★

✗ It's not going to win a fashion show.



Maxtor OneTouch III Mini Edition

The OneTouch III Mini Edition 100GB (approx. 93.1 GB formatted) is a USB drive designed for easy backups. From a technological perspective, the unit is average. It features a 5,400rpm disk with an 8MB buffer and 9ms seek-time. On the bright side, it weighs only 205 grams. The shell appears to be durable, although it is hard to say how much pressure it could withstand.

To use the "one touch" button, the user must first install a number of programs. The backup manager lets the user select which directories

need to be backed up. Obviously, the software also allows the user to schedule backups, sync, restore and rollback. Furthermore, the unit comes with Maxtor DriveLock, which attempts to hide data from unauthorised users.

Maxtor's OneTouch III Mini Edition has a USB interface, but not FireWire, which makes it less

versatile than LaCie's Rugged All-Terrain Drive. It is also slower, but there is a noticeable price difference too. The unit comes with a USB Y-cable which can be used for additional power-sharing.

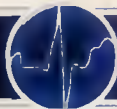
CONTACT	Maxtor
PHONE	(02) 9369 3662
ONLINE	www.maxtor.com.au
MARKET	Everyone
PRICE	\$229

✓ One-touch button; featherweight.

.. VERDICT ★★★★★

✗ Disk speed; USB only.





Samsung VP-MS15

Samsung's VP-MS15 is a six-in-one multifunctional device. It incorporates a camera with a 5.25MP CCD and 3x optical zoom, an MP3 player, voice recorder and camcorder. It also doubles as a storage device and a webcam (when attached to a computer). It has 512MB of internal memory and a mini SD slot — a 2.5in LCD rounds off the package. It is good to see that Samsung fits a lot of functionality into a very small package. The whole unit weighs less than the other two cameras in this roundup — 118 grams — and looks very elegant.

The dimensions of the VP-MS15 are 94.9 x 19.3 x 56.3mm (W x D x H), which makes it the most compact unit out of the ones we reviewed. The camera uses a digital image stabiliser which helps

to eliminate shakiness. The quality of photographs is generally good. All the usual things, such as exposure control and flash settings, are available to the user. The unit also supports direct PictBridge printing.

The MP3 player is very basic but usable. An internal speaker is built into the unit, so headphones don't need to be used in quiet environments. Although, given the speaker's size, the quality of sound leaves a bit to be desired.

Overall, the VP-MS15 succeeds as a multifunctional device. It's easy to use, light and friendly.



CONTACT	Samsung
PHONE	1300 369 600
ONLINE	www.samsung.com/au/
MARKET	Everyone
PRICE	\$699

✓ Good concept; great execution.

VERDICT ★★★★★

✗ Price; only accepts mini SD.

Kodak EasyShare Photo Printer 500



Kodak's photo printers process each photograph four times from top to bottom. At each iteration, the printer applies a new layer of ink as the photograph gradually comes alive. Other photo printers — like Sony's DPPFP35 — take a similar approach.

The EasyShare Photo Printer 500 can print most photos in about sixty seconds. Our tests showed that the quality of prints is generally acceptable, although a lot of images came out too saturated (colour mode was set to natural). The unit comes with a big 3.5in LCD, but its quality isn't very good.

The Photo Printer 500 can read all kinds of memory cards and is PictBridge compatible (plus it has Bluetooth built in). It can communicate via Wi-Fi when an appropriate Wi-Fi card is added. The printer supports a number of editing features, including crop and red-eye reduction.

Being only about 1.262kg, this printer isn't too heavy. It measures 33.4 x 16.6 x 7.8mm (W x D x H), excluding all protruding parts. To print your photos you must use a paper tray and have enough space for the photo to come out from the back. Therefore, it shouldn't be placed in extremely cramped spaces. The Photo Printer 500 can also be connected and used from a computer.

CONTACT	Kodak
PHONE	1800 267 588
ONLINE	www.kodak.com.au
MARKET	Everyone
PRICE	\$299

✓ Lightweight; built-in Bluetooth.

VERDICT ★★★★★

✗ On the default setting, colours come out saturated.

Apple iPod 80GB

What can one say that hasn't been said before about Apple's flagship product? It is delightful, expensive, stylish and oh-so-beautiful. The high-end iPod feels heavy (156 grams), especially in comparison with the nano, but it is lighter than the ZEN Vision:M. The 80GB model is said to last for up to 20 hours playing music, or 6.5 hours playing video. In comparison, the 30GB model is said to last for about 14 hours of music or 3.5 hours of video.

The sound it produces is crystal clear. We had no problems in this

department. Unfortunately, iTunes ruined an otherwise faultless experience. It would be wonderful if Apple opened up this platform. The included games are nothing to write home about but they are easy to control. There is still no radio or voice recording. In truth, this device is so beautiful we hope it doesn't develop problems seen in previous

CONTACT	Apple
PHONE	13 36 22
ONLINE	www.apple.com.au/store/
MARKET	Everyone
PRICE	\$499

generations, such as rapidly depleting batteries and cracked screens. iPods have had their share of problems, but we genuinely hope that this generation of iPods is going to be the best yet — that is, until the full-screen iPod comes along.

✓ 80GB ought to be enough for the next six months.

VERDICT ★★★★★

✗ Big price; iTunes; still no radio or voice recorder.



FSP Mobile Power

Most mobile devices either come with a cigarette adapter charger (as standard) or you can buy one as an optional accessory. This can quickly get expensive if you buy one for all your gadgets, and you can forget about finding one for larger mobile devices like a laptop.

This is where the FSP Mobile Power unit comes in. At around 400g, it's portable enough to keep in the glove compartment "just in case". The Mobile Power doesn't carry any charge itself — rather, it converts power from the 13V cigarette lighter socket to the 115-230V AC power required.

A standard-sized power outlet sits on one side, which is where you plug the charger in. We found this worked well for charging a laptop while driving, although it heats up noticeably when in use. Like a PC, it has a fan to dissipate heat, and power automatically cuts out if the unit overheats or overloads.

The flexibility of the Mobile Power makes it ideal for extended road trips, letting you plug in everything from hair dryers and electric shavers to televisions and microwaves. At \$65, it's not much more than the cost of a mobile phone cigarette lighter charger.

CONTACT	Anyware
PHONE	(02) 9879 5788
ONLINE	www.anyware.com.au
MARKET	Everyone
PRICE	\$65

✓ More power on the road.

VERDICT ★★★★★

✗ Gets a tad warm.

Canon PowerShot A710IS

A classy-looking digital camera which features a 7.1MP (3,264 x 2,176 res) CCD sensor, 6x optical zoom, 2.5in LCD screen and an optical image stabiliser. Although not the thinnest or lightest device, it looks great and feels comfortable. It can be argued that the zoom wheel is placed in an inconvenient location for people with large hands, but it all depends on the user. The LCD is gorgeous; there is also an optical viewfinder.

In automatic mode the camera offers excellent quality, but it can be switched from automatic to manual

control if more precision is required. A large amount of preset modes are included, as well as about eleven colour modes.

Flash takes about three to four seconds to recharge; this isn't fast, but the camera uses only two AA batteries. Unfortunately, the SD slot is placed in the battery compartment, which is a little

awkward. The camera weighs about 210 grams and is 97.5 x 41.2 x 66.5mm (W x D x H, excluding protruding parts). The quality and features of this camera should make it worthy of your attention.

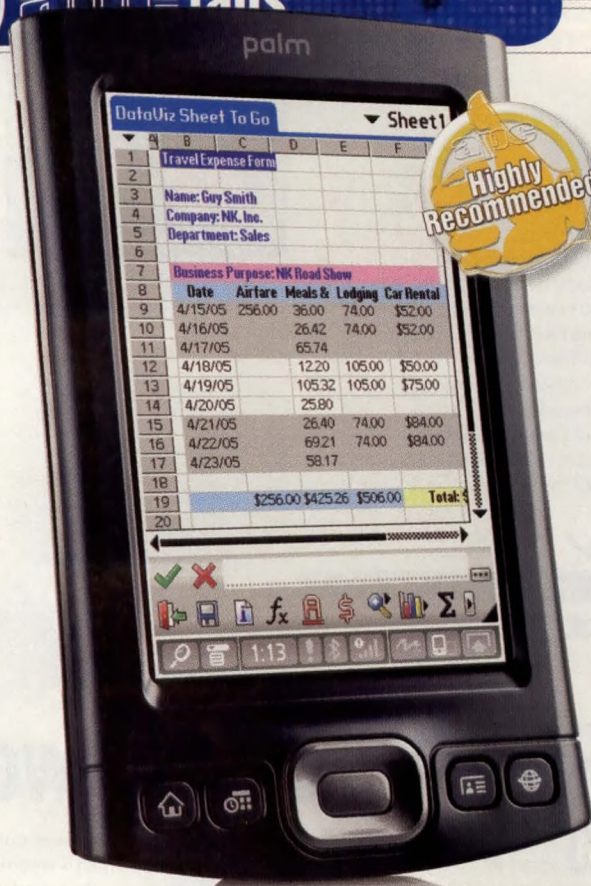
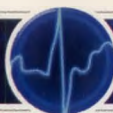
CONTACT	Canon
PHONE	1800 021 167
ONLINE	www.canon.com.au
MARKET	Everyone
PRICE	\$549

✓ Image stabiliser; manual controls; good quality.

VERDICT ★★★★★

✗ Location of SD slot; flash recharge time.





Palm T|X

The T|X is the latest non-phone PDA from Palm and, while it was released over a year ago, its feature set and form factor still compare favourably to other, newer handhelds on the market.

Palm throws in a media application for viewing pictures and video, as well as Pocket Tunes for playing MP3s, but the T|X's real strength lies in its productivity offerings. Internet and email access is available using 802.11b WLAN or Bluetooth (via a compatible data-enabled phone), and a generously sized 3.8in display with 480 x 320 resolution makes the T|X's Office capabilities a lot more attractive for day-to-day use.

Internal storage is limited to 100MB but, as it's not a multimedia-oriented device, this is more than enough for storing PIM data and Office files. If not, the SD/MMC slot makes it cheap to add more memory. With normal usage, the T|X provides roughly five days of battery life before needing a top-up.

By not tricking it out with extras like a digital camera and a mobile phone, Palm has managed to keep the T|X very sleek and light. The midnight blue plastic casing feels very durable and solidly constructed — combined with the bundled flip cover, the T|X is well-equipped for a rough-and-tumble life on the road.

CONTACT	Palm
PHONE	1800 350 535
ONLINE	www.palm.com/au
MARKET	Everyone
PRICE	\$499

✓ Good productivity features (if you just can't stay away from work).

VERDICT ★★★★★

✗ More workhorse than show pony.

Sony PSP

The PSP is first and foremost a portable gaming device. With hundreds of titles across all the main game genres and a hardware design that's optimised for mobile use, it's easy to see why the PSP is still popular over a year after its launch.

But even non-gamers can get something from the PSP. The 4.3in wide-screen LCD and landscape orientation gives it a form factor suited for multimedia, with music, photo and video playback supported within the software. For a device this size, it

seems odd to have no built-in storage, but a memory card slot lets you add storage using the relatively inexpensive Memory Stick Pro Duo format.

Worth noting is that maximum volume — even with headphones attached — is weaker than on other media players.

You can also purchase UMD movies to play on the PSP — basically smaller versions of the DVD format.

However, these can only be played on the PSP. Combine this with a limited range of available titles and relatively high prices, and you're better off buying the DVD version and watching the movie at home.

The integrated 802.11b Wi-Fi is mainly designed for

wirelessly sharing gameplay with friends, but a bundled web browser is also on board — a nice feature to have, though entering URLs is fiddly and many sites aren't rendered properly for the small screen size.



CONTACT	Sony
PHONE	1300 365 911
ONLINE	www.yourpsp.com.au
MARKET	Everyone
PRICE	\$329.95

✓ Movies and games on the go.

VERDICT ★★★★★

✗ No built-in storage; web usage is hit and miss.

Dopod 838Pro

The 838Pro is about as multifunctional as it gets for a PDA — a fact that's reflected in its high-end price tag. It's not that much larger than a standard-sized mobile phone, but it packs in a two-megapixel camera, 802.11b/g WLAN and Bluetooth 2.0 and a slide-out QWERTY thumbboard, not to mention support for quad-band GSM, tri-band WCDMA, EDGE and HSDPA.

This form factor and feature set make the 838Pro ideally suited for mobile email and web browsing. Sliding the thumbboard out automatically switches the display

orientation to landscape for a two-handed grip, and an ample array of buttons minimises the need to use the stylus. On Telstra and Vodafone's new HSDPA networks, speeds of up to 1.5MB/s are possible. No need to squander all that bandwidth on such a small device, though — the wireless modem application lets you share the high-speed connection with a notebook that's connected over USB, Bluetooth or infra-red.

Windows Mobile 5 Pocket PC Phone Edition is the brains of this operation, providing push email, Outlook synchronisation and

support for Office files, among other features. Performance is zippy thanks to the 400MHz Samsung processor and, while the 2.8in screen is small by conventional PDA standards, it's still a good size for multimedia and phone use.

CONTACT	Dopod
PHONE	N/A
ONLINE	www.dopod.com.au
MARKET	Everyone
PRICE	\$1,499



✓ GPS and lightweight.

VERDICT ★★★★★

✗ Small screen.



CONTACT	HP
PHONE	1300 304 889
ONLINE	www.hp.com.au
MARKET	Everyone
PRICE	\$499

✓ Feature-heavy...

VERDICT ★★★★★

✗ ...except for a camera.

HP iPAQ rx4540

The iPAQ rx4540 isn't from the standard Pocket PC mold. Instead, HP has pitched the device as a "Mobile Media Companion". It doesn't have any extra music, photo or video capabilities over other PDAs running Windows Mobile 5, but 1GB of flash memory, an SD/MMC card slot and a 3.5mm audio jack — not to mention a sturdy plastic exterior and pocket-sized dimensions — make it more suitable for mobile entertainment.

That said, it doesn't skimp on productivity features. 802.11b/g WLAN and Bluetooth 2.0 are included for wireless connectivity, and a full

suite of Office, Outlook, web-browsing and email applications are installed as standard.

The 2.8in QVGA touchscreen is bright and viewable from all angles and, while the external speaker isn't as loud as we'd like, audio quality with earphones plugged in is outstanding.

Given that most PDAs and mobile phones come with a built-in camera, the lack of one on the rx4540 is surprising. An FM radio also would've complemented its other multimedia capabilities nicely, as would media playback buttons on the unit's face.

Garmin nuvi 660

A good-sized screen makes a world of difference on a GPS device, and in this regard the nuvi 660 excels. Its 4.3in wide-screen display is of impeccable quality, with a brightly lit 480 x 272 resolution, vivid colours and an anti-glare coating that retains perfect visibility in direct sunlight.

We had no complaints with the nuvi's GPS capabilities. Getting a signal lock takes a couple of minutes, but subsequent signal quality is strong with the SiRF III GPS receiver — aided by a flip-up antenna. The maps are rendered well, the interface is user-friendly.

Sadly, this isn't matched by audio quality. Voices sound more robotic than natural and, while the external speaker has a loud maximum volume — which we had to use in order to have the radio on simultaneously — it distorts quite noticeably at this setting. You don't have to rely on the nuvi's crummy speaker, though, as it comes with a built-in FM transmitter for wirelessly relaying audio to your car stereo.

The nuvi has a lot to offer outside a vehicle as well. Support for MP3s, audio books and pictures make it a media player substitute, and it comes with 415MB internal memory

and an SD/MMC expansion slot. It supports language guides and travel guides, but these are additional purchases. Other features include a Bluetooth hands-free, world clock, currency converter and unit converter.

CONTACT	GME
PHONE	(02) 9879 8888
ONLINE	www.gme.net.au
MARKET	Everyone
PRICE	\$1,199



✓ Huge, top-quality LCD.

VERDICT ★★★★★

✗ Turn the sound off!

THE
playersthree
TESTED

VENDOR	MODEL	PRICE	ONLINE	PHONE
1. ASUS	F3JM	\$2,799	www.asus.com.au	1300 278 788
2. Dell	XPS M1710	\$4,499	www.dell.com.au	1800 812 393
3. Pioneer	DreamBook Power M57U	\$5,699	www.pioneer.net.au	1300 883 218



Gaming notebooks

Dan Chiappini takes gaming on the move and road tests three hot new notebooks.

Gaming has started to finally go mainstream. Computing hardware changes almost daily to accommodate new game features and give gamers the experience they crave — while the games industry can only survive if the hardware is there to bring their vision to fruition.

So popular is gaming that even the major and often very traditional notebook manufacturers have jumped on the bandwagon, knowing gamers will pay top dollar to be able to do what they love away from home. In many cases, gamers will opt to forgo the once-bragged-about gaming rig in favour of a notebook with the same grunt, then

use the leftover money to purchase a large screen monitor to pipe video out of the notebook.

No stranger to our testing, Pioneer's DreamBook Power M57U was the first gaming 'book to grace our Labs. A slightly tweaked version of the machine we reviewed in the APC November 2006 issue (page 37), it packs Intel's newest Core 2 (codenamed Merom) T7200 chip, a 2.33GHz part with a massive 4MB L2 cache, and 2GB of 667MHz DDR2 memory, enough power to crush most home PCs. Pioneer includes a 100GB 7,200rpm hard disk drive which provides the capacity for multiple games and files, with the speed of a desktop part. Given hard

disks are a major system bottleneck for both mobiles and desktop machines, we were keen to see if the drive would provide enough boost to push it into the top spot.

We know, we know: all the hard drive speed in the world doesn't topple the might that is a gaming system's graphics card. Fret not, the DreamBook passes on the mediocre and has gone straight for Nvidia's GeForce 7900GTX, their top-of-the-line card and a gamer's best friend. Able to pump out serious frame rates, the 7900GTX is the DreamBook's make-or-break part when it comes to gaming on the go.

It's all well and good having a beastly graphics card, but you

need a display that's going to do it justice. This behemoth features a 17in wide-screen 1,920 x 1,200 resolution panel. It's quite bright, but did occasionally flicker, although we were working with an engineering sample (or perhaps the delivery guy played a little too roughly). Either way, hopefully this issue will be ironed out before it hits the shelf.

Just when you thought you couldn't fit in any more features, the Pioneer throws in an oddly named Bison Cam 1.3 megapixel webcam mounted at eye level in the top of the display and a dual-format analogue/digital TV tuner. The machine ships with Windows Media



Center and, using the included remote and large hard drive, you can be up and recording or watching TV out of the box. Not a killer feature for gamers, but another step in the all-in-one device philosophy.

ASUS fronted up next and we expected good things from a brand that manufactures motherboards and dedicated enthusiast graphics cards specifically designed to overclock. At roughly half the cost of the Pioneer machine, ASUS has put together a corker of a notebook for budget-conscious gamers: the F3JM features a 2GHz T7200 Core 2 Duo,

1GB of memory and the respectable GeForce Go 7600. While it's obvious some concessions have been made to hit this price point, ASUS bundles a 120GB drive (although it is the slower 5,400rpm type), Bluetooth and a tri-band 802.11a/b/g wireless adaptor. While ASUS was one of the first brands to embed a webcam into a notebook lid, they've now become standard fare, with the F3JM also including one.

The GeForce Go 7600 drives the bright and clear 15.4in wide-screen display (4:3 aspect ratio is dead), and serves well for general-



purpose multimedia use and dedicated gaming.

ASUS is also the only brand featured to include an optical mouse and, while you may discount it as a novelty add-on, it's one less thing for you to have to buy when shopping for a notebook. The touchpad is smooth and responsive, but the single pressure sensitive left and right mouse bar is less than ideal for gaming, especially for the first-person-shooter crowd.

ASUS was also the only gaming notebook to include a TPM (Trusted Platform Module) chip built onto the

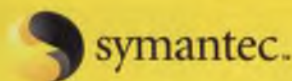
motherboard — storing encryption keys. Although these are normally found on business laptops (to protect data if the unit is lost or stolen), they work with the included ASUS Security Protect Manager software, to ensure that your valuable files and games will be safe when you leave the notebook in a taxi.

While Dell has traditionally had a much better presence in the budget and business-fleet notebook markets, it's been pushing the XPS branding to gamers and power users. We really thought we would

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RETRAVISION

THE GOOD GUYS



see the usual offshoot business model stuff: a generic chassis design, middle-of-the-road specs and over-the-top pricing, but we were happily wrong. Since taking our first look at the Dell XPS M1710 earlier this year, Dell has made a few minor revisions, but the core machine is still giving gamers what they want. Dell completes the trifecta of units to sport an Intel Core 2 Duo processor — further cementing the CPU's place at the top of the performance heap as the chip of choice for gamers.

Dell has opted for the T7400, a 2.16GHz version slotting in between Pioneer's T7600 and the ASUS T7200, although there's less than 200MHz either side and all three support the large unified L2 caches. Dell also includes a 100GB 7,200rpm SATA drive and GeForce 7900GTX, giving gamers the speed and capacity they're so desperately after (and more than willing to pay for).

Dell's XPS M1710 also gives users the ability to cycle coloured LEDs inside the machine, producing a glow effect through four ports on the chassis. It's completely gimmicky and serves no practical function, but it's a cool way to personalise your notebook — and there's always the option to turn them off if they're not for you.

Dell's audio was far and away the best, removing most of the tinnyess found in cheap notebook speakers that we've come to know (and begrudgingly accept). The Pioneer's audio quality was similar to that of the Dell, but it tended to be a little muddy in comparison. ASUS fared worse — its model sounded a bit too tinny for our liking. A good pair of headphones will serve you well on each.

We threw all three against each other in a head-to-head Challenge to crown a single winner in the category. First up was PCMark05, and the Pioneer blasted out of the gates, ripping through the test and turning in an impressive 6,012 marks. Dell nipped at its heels with a solid 5,819, while ASUS brought up the rear with a respectable score not far short of 5,000 marks, with 4,790.

3DMark06 turned the tables slightly and saw Dell sneak ahead of Pioneer by a narrow margin, 4,798 to 4,770. ASUS stumbled slightly with its slower GeForce 7600, but still turned in a reasonable 2,013 mark score and enough for playable gaming.

Our battery test separated the pack further, Dell taking out bragging rights with its two hours and 37 minutes of run time, edging out ASUS, which sat at two hours 27 minutes. Pioneer, the bulkiest machine, obviously consumes the most power with a mere one hour and 45 minutes under load. While we didn't expect long run times from units specifically engineered to perform quickly (not lengthily), Dell's two and a half hours is enough to watch a full-length movie or complete a few levels of your game of choice (while away from a power point).

The XPS M1710's strong overall performance in CPU and graphic-intensive tests, such as gaming, proves it to be top of this class. Its combination of a high-definition 1,920 x 1,200 display, 7,200rpm hard disk, brand new Core 2 Duo CPU and GeForce Go 7900GTX makes it a power to be reckoned with, no matter what your usage model. Just make sure you keep your power brick handy, lest you run out of juice on the move. **apc**

	ASUS F3JM	DELL XPS M1710	PIONEER M57U
GAMING NOTEBOOKS			
CPU	Intel Core 2 Duo T7200	Intel Core 2 Duo T7400	Intel Core 2 Duo T7600
RAM	1GB DDR2	2GB DDR2 SDRAM	2GB DDR2
Hard disk	120GB	100GB	100GB
Optical drive	DVD Super Multi dual-layer	Internal 8x DVD +/- RW	8x dual-layer DVD +/- RW
Modem	Internal 56k modem; integrated fast Ethernet 10/100/1000	Internal 56k modem; integrated fast Ethernet 10/100/1000	Internal 56k modem; integrated fast Ethernet 10/100/1000
Wi-Fi	Intel PRO/Wireless 3945 dual-band 802.11a/g 54Mbit/s wireless mini card	Intel PRO/Wireless 3945 dual-band 802.11a/g 54Mbit/s wireless mini card	Intel PRO/Wireless 3945 dual-band 802.11a/g 54Mbit/s wireless mini card
Graphics adaptor	Nvidia GeForce GO 7600	Nvidia GeForce GO 7900GTX	Nvidia GeForce GO 7900GTX
Graphics memory	512MB	256MB	256MB
USB ports	4	6	4
FireWire	1	1	1
Expansion slot	ExpressCard	ExpressCard; 5 in 1	ExpressCard
Tuner	None	None	DVB-T; analogue
Video/monitor out	S-Video; 15-pin DSub	S-Video; component; DVI	S-Video; DVI SPDIF
Audio out	Integrated sound; stereo headphones/speakers miniconnector	Integrated sound; SPDIF; stereo headphones/speakers miniconnector	Integrated sound; SPDIF; stereo headphones/speakers miniconnector
Screen size	15.4in	17in	17in
Screen ratio	Wide-screen	Wide-screen	Wide-screen
Screen resolution	1,680 x 1,050	1,920 x 1,200	1,920 x 1,200
Battery capacity	6-cell	9-cell	8-cell
Weight	2.95kg	4kg	3.8kg



✓	Well priced.	Good gaming performance.	Multimedia all-rounder.
✗	Average performance.	Heavy.	Poor battery life
Verdict	★★★★☆	★★★★☆	★★★★☆

NEW!

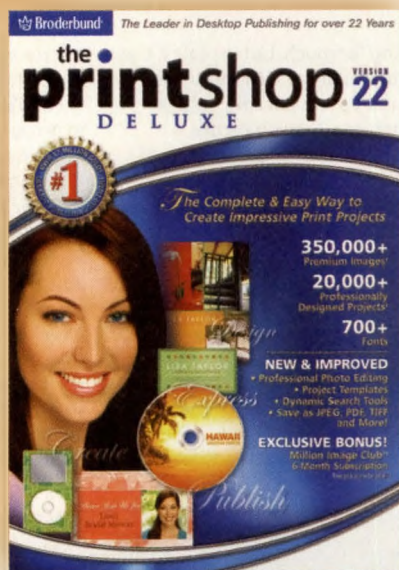
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Vista-ready business desktop PCs

Vista Business is here. *Dan Chiappini* assesses what it means to be "Vista-ready" — by testing four new business PCs.

With Vista for business now available, we've got hold of four brand-spanking-new tier one vendors' Vista-capable business offerings. Microsoft's certification process for a "Vista Capable" sticker is not that stringent. To be eligible, the system needs to be at least 800MHz, have 512MB of system memory and include a

DirectX 9-capable GPU in the box, either as an integrated part or as an add-on card.

THE PACK

We sent out the call for desktop systems that would be specifically marketed as "Vista Ready" or "Vista Capable". After reading the Vista-ready spec, this may not have been

asking for much, but in reality, the industry standard for business PCs now has them packing quite a punch. Most are dual-core machines with large amounts of RAM. We specified machines should not exceed \$2,500 in price and include a keyboard, mouse and monitor — all the gear to drop it on the desk and go.

We understand many businesses opt for volume or site licensing for software, particularly OSs, so we left it open to vendors as to whether or not the machine would include a licence in the cost; although, if you're negotiating with

a vendor, you can shave that off our pricing straight away.

Dell's Optiplex 745 was the first to arrive, featuring Intel's mid-range Core 2 Duo E6400 processor, clocking in at an impressive 2.13GHz and rocking a huge 2MB L2 cache.

It may seem a little overkill for your average business user doing spreadsheeting and checking email, but they're stock features that ship across the range. Inside we found a gigabyte of memory spread across two 512MB DIMMs, an 80GB SATA hard disk drive and dedicated ATI Radeon X1300



Business PCs come in all shapes and sizes. Accessibility should always be a major consideration.

THE players

four
TESTED

VENDOR	MODEL	PRICE	ONLINE	PHONE
1. Dell	Optiplex 745	\$2,448	www.dell.com.au	1800 099 380
2. Lenovo	ThinkCentre M55	\$2,148	www.lenovo.com.au	1300 557 073
3. HP	dc7700p	\$2,299	www.hp.com.au	13 23 47
4. Acer	Veriton 5900	\$2,499	www.acer.com.au	1300 366 567

graphics. Dell was the only machine to move away from Intel's GMA 3000 integrated graphics and, as a result, there's 128MB of video memory which can be used to better render the transitions and window effects in Vista.

Acer's Veriton 5900 turned up next and we were surprised, even before looking at the specs, at the difference in size between the two units. The Optiplex is compact and quiet, while it seems Acer may be recycling some of its consumer chassis designs in the business space. The case was considerably larger (and as a result roomier inside), but does come at the cost of reduced desk real estate.

On the spec side it features the same Intel Core 2 Duo E6400 as the Dell model, but does pack an additional gig of memory, taking it to two gigabytes, more than enough for business usage. Acer was also the only company to supply a machine with more than an 80GB hard drive, instead packing a 160GB 7,200rpm SATA unit inside. It and the extra memory are nice little added extras for \$50 more than the Dell system although, even in your typical small/home office, users

are moving towards centralised network storage.

HP came to the party with their dc7700p model, a small form factor desktop sporting Intel's Core 2 Duo E6300 processor. While 200MHz slower than the E6400 of the Dell and Acer machines, it's still more than enough for day-to-day office work. HP includes an 80GB SATA hard drive and a gig of system memory. A Windows XP Professional licence is included in the price and a 19in LCD display rounds out the package nicely.

Lenovo was the last machine to arrive and, at a mere 87.5mm high, 310mm wide and 358mm long, is one of the smallest chassis here, saving you desk clutter without compromising on performance.

Like HP, Lenovo has gone for the cheaper (but only slightly less powerful) Intel Core 2 Duo E6300, middle-of-the-road 1GB of system memory and the bog-standard 80GB SATA hard disk drive. Graphics are from an integrated Intel GMA 3000 GPU, and while certainly no gaming powerhouse, this provides the eye-candy parts of Vista without blowing the budget. Lenovo includes a sizable security software bundle and,

combined with the Trusted Platform Module (TPM), will keep your sensitive work documents safe and help keep your network free of rogue machines.

SECURITY

All four of the machines are based on Intel's vPro technology, giving administrators options for out-of-band (OOB) management and maintenance as well as virtualised work environments. Intel's Active Management Technology (AMT) allows you to cordon off infected or unauthorised machines before they can do damage to the wider network, even when machines are off or out of operation through damaged hardware.

Since protecting your hardware investment is such an important aspect of running a network, it's encouraging to see that each vendor also ships their own security software package. All of the machines on show include a TPM (Trusted Platform Module) for authentication onto a network as well as securing the integrity of the local data, even in the event that the machine is stolen.

Windows Vista will include a feature called BitLocker Drive

Encryption, allowing you to encrypt an entire OS volume and authenticate by handshaking with both the motherboard's TPM and a USB memory key at start up.

While the security packages vary slightly in features, the offerings are similar. Acer was a little on the barebones side, and HP included its usual log-on Credential Manager and recovery tools, but it was Dell and Lenovo that impressed us most with their security centres, both of which included secured log-on, password vaults, recovery and migration software.

PERFORMANCE

Performance is generally not the first thing to look for in a business machine, unless it's a high-powered graphics workstation. Frank in accounting doesn't need a dual Xeon beast for Excel, and neither does anyone using Word or playing Minesweeper when no one is looking.

Still, with expectations that Vista for business would give business PCs a heavier workout than its predecessors, we went about testing each machine to see how much grunt it packed.



Ironically, we decided not to use the Vista Release Candidate for testing, given its lack of optimisations and ongoing tweaking before release, so we did the grunt tests using Windows XP for a fair comparison.

PCMark05 gives us the best possible look at a system's overall capabilities by running through a series of encryption, antivirus scanning, real-time spell-check and other everyday tasks. Performance is relative to the graphics subsystem and system memory and, as a result, is great for showing shortcomings.

Dell, with its combination of Intel's E6400 CPU, gig of memory and 128MB dedicated graphics shot to the front of the queue,

taking out first place with a score of 4,361, edging out Acer's 4,278 score. The large L2 caches found on all the Core 2 machines helped with multi-tasking tests, while the 2GB of memory in the Acer helped propel it ahead of the HP and Lenovo machines. HP took third place with a solid 3,688 score, while Lenovo brought up the rear with 3,279 marks — still a reasonable score for an office workhorse.

Winstone Business 2004 is about as good as it gets for business-focused benchmarks. PCMark05 includes multimedia tests to gauge the overall performance; Winstone is focused entirely on the work side of the show. Each run tests Outlook, Word, Excel and web site content creation as well as a real-time antivirus scan and

multithreaded tests to stress the system under load. We ran each machine through three iterations of the benchmark and averaged performance.

Acer led the charge, slamming out of the gates and turning in an impressive score of 27.1, while Dell trailed by less than a whole point at 26.3. The margin opened up slightly between second and third place, and again HP and Lenovo were left to bring up the rear with 22.4 and 22.1 respectively, due largely to their slightly lower clocked CPUs and integrated Intel graphics.

DESIGN AND EXPANSION

We love getting stuck into the guts of PCs and, while it may sound odd, workstations and thin clients like these are particularly fascinating because space really is limited.

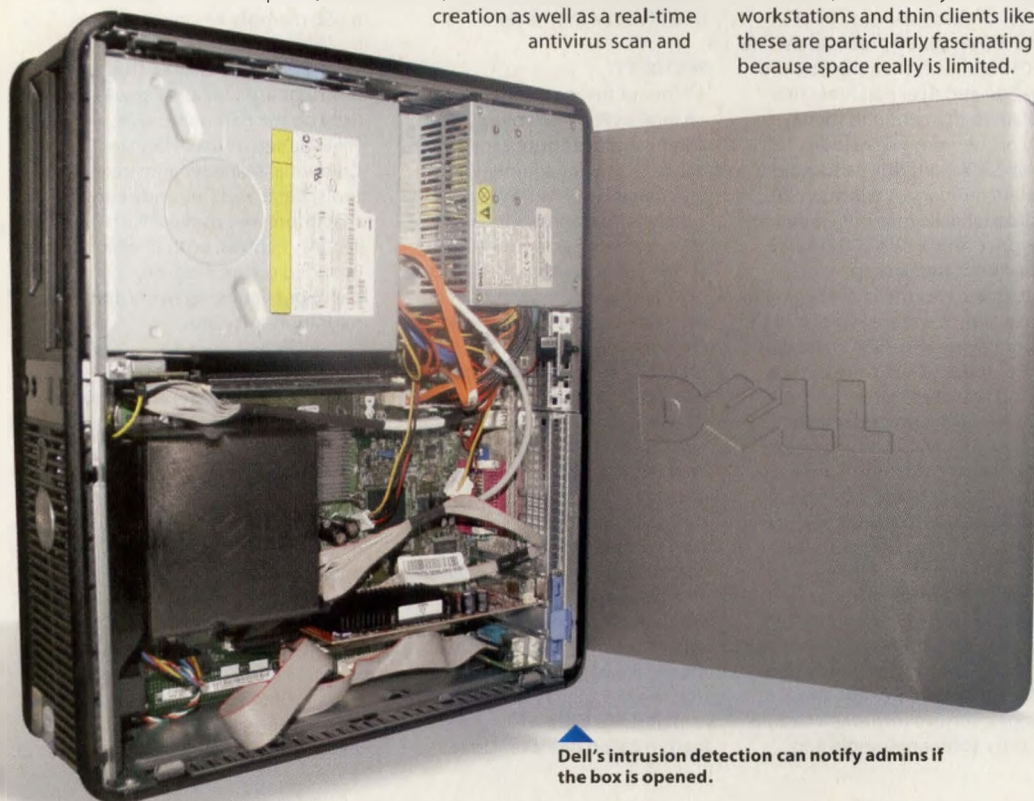
Most interesting to note is the absence of PATA cabling either for hard disks or optical drives. Instead, all the machines use SATA for both their DVD drives and HDDs and subsequently give more airflow through the chassis.

Even with their standard 3-year onsite warranties, IT departments don't want to be faffing around waiting for service technicians to turn up, so it's encouraging to see how easy it is to work on these machines even for someone with very little technical experience. Each case either slides off or has a hinged side that, once unlocked, reveals the components.

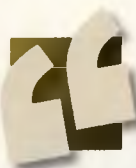
Most drives are secured without tools, either going for slide-out bays with rails, plastic holders or mounts at the bottom of the case. HP impressed us here with its power supply design, which simply folds out once the case has been opened, removing the need for tools and letting you swap out what is sure to be one of your first points of call when the machine carks it. The only thing that would make this better would be modular points on the PSU itself, saving you from needing to unplug the entire board.

The box comes with two 512MB DDR2 DIMMs installed and two more slots for expansion, topping you out at 2GB unless you replace the two half gigs with full gigabyte modules. On the plus side, your graphics can easily be expanded with a free PCI-Express card slot, and other components installed via the 1x and PCI 32-bit slots.

Acer's modified desktop machine affords plenty of room inside its huge chassis, but it was substantially harder to remove the top cover than any other box we received. Once inside, the optical drive has a front-mounted slide



▲ Dell's intrusion detection can notify admins if the box is opened.



WE LOVE GETTING STUCK INTO THE GUTS OF PCs: WORKSTATIONS ARE PARTICULARLY FASCINATING BECAUSE SPACE REALLY IS LIMITED

and the side orientation of the hard disk is easy to remove. Two 1GB memory DIMMs come pre-installed, with two more slots available for expansion. There's also a free PCI-Express lane for graphics, PCI slot and a PCI-E 1x should you ever need it. While the case is larger, it does support full height add-on cards rather than making you chase those expensive half height parts.

The Lenovo ThinkCentre M55 model is easy to access and work on with its tool-less design. The embodiment of engineering, hardware is splayed for you to grab and change as the mood takes you. Despite being the smallest machine here, it too, like the Acer, supports full-height PCI and PCI-E 1x cards with the included side-mounted riser. This is shared by the half-height PCI Express graphics slot, so you're going to have to make a decision which is more important: ditching integrated graphics or PCI/PCI-E 1x expansion. The board caters for two DDR2 modules and comes with one filled. The case is compact, strong and well designed, but lacks padlock support for securing the chassis. Kensington locks can be used but represent an additional cost to smaller businesses when a cheap padlock would suffice.

Dell was the last machine to get the accusatory eye — and fared reasonably well. It was the only machine to include intrusion detection and can notify administrators if the box is physically opened. This shouldn't be too much of an issue as there's support for padlocking it shut. Inside we find an unoccupied PCI 32-bit slot, a single 64-bit PCI slot and four spots to chuck in RAM. Unfortunately, the 32-bit PCI slot's backplate is home to the serial and PS/2 ports — and the optical drive needs to be removed in order to access half of the unit's memory sockets.

THE VERDICT

The systems we tested fill a few different usage models and price brackets. If you're particularly budget-conscious and don't mind

integrated graphics (and why would you for everyday desktop use?) then Lenovo's ThinkCentre M55 will serve you well and is certainly capable of holding its own. HP is a little more expensive for the same breed of machine but has the added advantage of simple user-replaceable parts such as the power supply. Unless you're a business with dedicated IT staff,

you probably don't want your employees up to their elbows in PCB, but the option is there for smaller businesses without in-house support.

Acer is a worthy contender for your business dollars, but the difficulty of accessibility of the case might be a problem for inexperienced users. The 2GB of memory will suit power desktop

users, but you're still reliant on the GMA 3000 graphics, which may only provide the basic Vista experience. The 160GB HDD is certainly a bonus though.

Dell's offering isn't over the top with its baseline 1GB of memory and 80GB hard drive, but the inclusion of a 128MB dedicated video card will help smooth out your desktop experience and enable those translucent windows. Solid performance, options for future expansion and easy maintenance, make the Optiplex 745 well worth a look for your next end-of-financial-year spend. **apc**

	DELL OPTIPLEX 745	LENOVO THINKCENTRE M55	HP DC7700P	ACER VERITON 5900
CPU	Intel Core 2 Duo E6400	Intel Core 2 Duo E6300	Intel Core 2 Duo E6300	Intel Core 2 Duo E6400
RAM	1GB DDR2 (2 x 512MB)	1GB DDR2 (1 x 1GB)	1GB DDR2 (2 x 512MB)	2GB DDR2 (2 x 1GB)
HDD	80GB SATA	80GB SATA	80GB SATA	160GB SATA
Motherboard	Intel Q965 chipset	Intel Q965 chipset	Intel Q965 chipset	Intel Q965 chipset
Graphics card	128MB ATI Radeon X1300	Integrated Intel Graphics Media Accelerator 3000	Integrated Intel Graphics Media Accelerator 3000	Integrated Intel Graphics Media Accelerator 3000
Monitor	Dell 19in LCD	Lenovo 19in LCD	HP 19in LCD	Acer 19in LCD
Keyboard	Dell USB Multimedia Keyboard	Preferred Pro Full Size USB	HP USB Standard keyboard	Acer USB Multimedia Keyboard
Mouse	Dell USB scroll mouse	USB optical wheel mouse	HP USB optical scroll mouse	Acer USB optical mouse
Operating system	Microsoft Windows XP Professional	Microsoft Windows XP Professional	Microsoft Windows XP Professional	Microsoft Windows XP Professional
Included software	Power DVD Software; Roxio Creator; OpenManage Client Instrumentation 7.	Diskeeper Lite; Google Desktop; Google Toolbar; Lotus Notes Stand-alone Client (license); Lotus SmartSuite Millennium edition (license); Picasa from Google; Sun JRE; Symantec Client Security (OEM edition) with 90 days of virus definitions; Adobe Acrobat Reader; PC Doctor diagnostics; ThinkVantage Rescue and Recovery.	HP Protect Tools Security Software Suite; HP Client Manager Software; HP Open View Configuration Management solutions; Altiris Deployment Solution; Symantec Antivirus 10.0 with 60 day Live Update Subscription; HP Insight Diagnostics Software; Computer Setup Utility; HP Backup and Recovery Manager; Microsoft Works 8.5; Microsoft Internet Explorer with Google Toolbar; Intervideo WinDVD.	Acer Empowering Technology; Acer LANScope; Norton AntiVirus 2006; CyberLink Power2Go; NTI CD-Maker Gold.
				
Warranty	3-years onsite parts and labour.	3-years onsite parts and labour.	3-years onsite parts and labour.	3-years onsite parts and labour.
				
				
				
Verdict	Dedicated video memory. Expensive. ★★★★☆	Easy maintenance. Only Kensington lock support. ★★★★☆	Easily removed power supply. Average performance. ★★★★☆	High-end CPU; 2GB RAM. Large; difficult to maintain. ★★★★☆



Vista-ready business desktops

The admin perspective

Choosing to upgrade to Vista in a business isn't just a case of buying a few licences. *James Bannan* pits the reality against the hype.

Business operating system upgrades are always a complicated affair — the larger the company the more complex it is. The main reason for this is that in a business environment, the OS is simply the base from which the real sources of productivity leverage — it's not the source of that productivity in isolation.

Businesses generally rely on specific applications to meet the day-to-day IT requirements of whichever industry they're in. And in the world of business apps, change is slow... if it ever comes at all. That's because choosing an application to help you achieve business goals isn't a decision lightly made. There's usually a substantial investment in time and money to get the infrastructure in place, users trained and so on. Once the decision has been made to go with a particular product, there's a huge amount of inertia to stick with it and make it work. And to this end, the operating system has to fit in with you, not you with it.

Having said that, the OS that forms the platform for your SOE has to be capable of being maintained and administered properly — after all, there's little point in sticking with Windows 98 just because it's the only thing the HR database works on. Huge amounts of time

and productivity can be lost by support staff trying to support the unsupportable. So if you're an IT admin considering Vista, there are two questions to be asked:

1. Does Vista offer benefits over our existing operating system and, if so, are they worth the cost and effort of migrating?
2. Will our current suite of applications work on Vista?

The first question really comes down to what you want from a good business system and whether the current needs are being met.

What makes a good business desktop? From the perspective of the entire lifecycle of the machine, you want it to run an OS that is both easy and flexible to deploy, centrally administered, reasonably secure and easy to fix when things go wrong. To achieve this, administrators invariably rely on third-party tools to get the job done, but much depends on the operating system's ability to interact with these tools.

In this context, Vista offers quite a wide array of benefits to business. The new file-based WIM image format gives unprecedented flexibility in creating and maintaining different SOE images across a range of hardware

platforms, without having to resort to non-Microsoft products — the first Windows platform to offer this level of functionality. This also helps when systems fail (as they are wont to do). The whole "reimage" prospect is much easier when the OS actually supports imaging natively.

Vista is far more secure than any other version of Windows. User Account Control, although of little use to home users, comes into its own in the business environment. Giving users the flexibility to make changes without compromising the underlying OS is a great feature and goes a long way to solving the problem XP administrators face when trying to lock down user access to the system without making it impossible to do get any work done.

And like Windows XP, Vista workstations can be updated via WSUS and administered via Active Directory Group Policy.

ARE YOU READY?

So is your business ready for Vista? Assuming the current SOE is based on Windows XP, the answer is going to depend almost entirely on the supporting infrastructure. The best environment in which to upgrade from XP to Vista is one running Windows Server and Active Directory, as Vista Business and

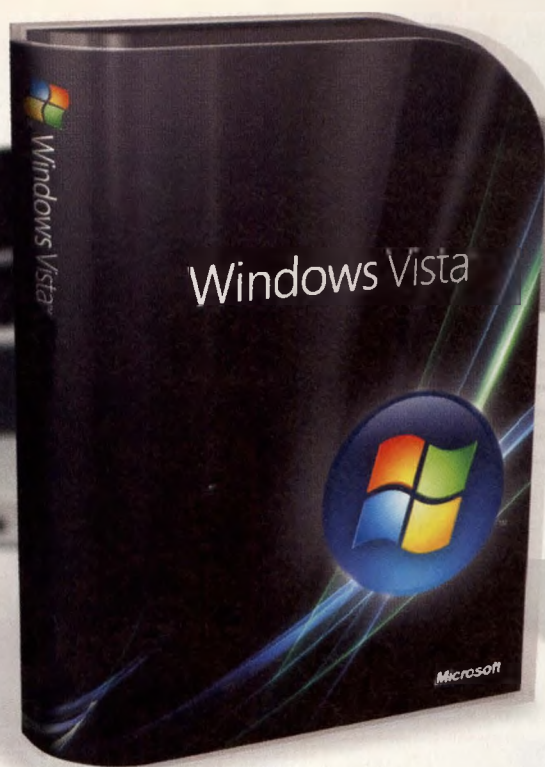
Enterprise system are really designed to be domain computers. Services like remote deployment and Group Policy are highly dependent on AD, so to deploy Vista in a non-AD environment is to deny yourself the many benefits of upgrading in the first place.

Of course, there are other products which support these services, but then you are in the realm of third-party products and you're completely dependent on how well they have implemented — and supported — Microsoft technologies.

Are your machines ready for Vista? Windows Vista has many new services and features, all of which take up machine resources. The bottom line is that Vista is much more intense than XP and will need a reasonable system to run well. If your current hardware platform isn't ready to shoulder the burden, then you'll probably be looking at a phased migration — new machines will run the new OS and old ones won't. As hardware is turned over, Vista is propagated throughout the business.

This raises another question — what is your licensing agreement for Windows XP? Most businesses purchase OEM Windows licences with each new hardware unit, but without Software Assurance you





can't upgrade those units to Vista, even if you are a Volume Licence customer. So, do you purchase new Vista licences for machines which were purchased with XP but which could physically run Vista? It's an option, but it will certainly blow out the TCO (Total Cost of Ownership) for those units. A cheaper option is to continue buying OEM licenses — it does mean that you'll be running a split XP/Vista environment for a while, but that's not necessarily a bad thing — for two reasons.

Firstly, the TCO of new Vista-based machines will by necessity be higher than XP systems. XP has been around for a while, so ongoing user training costs have been low — especially as, from a user perspective, XP wasn't very far removed from Windows 2000. Vista, on the other hand, looks and feels completely different and you'll have to get your users and support staff trained up. Factor in the double-whammy of Office 2007 and any migration to Vista/Office 2007 is starting to look extremely pricey. Under these conditions, running a split-OS environment spreads the cost of migration over a couple of business cycles and should even reduce the TCO of the second round of computers, assuming that your users get familiar with Vista/Office 2007 the first time round.

The second reason is that a split environment offers a fall-back position for legacy applications which don't migrate properly.

A wholesale migration to Vista means that every application has to migrate with it. This is, unfortunately, a manual process by the desktop admins, and represents a large investment in time and money. Running a split environment spreads the cost out and gives the admins longer to make the migration 100% successful and trouble-free.

THE IDEAL BUSINESS DESKTOP

One of the most important components of a business desktop

pretty good and is perfectly acceptable for business users.

These systems need to multi-task well, so dual-core processors are highly desirable, and at least 1GB RAM. Hard drive capacity isn't really important — a business image doesn't usually need much above 20GB except in special circumstances, and users should be saving files to the network anyway.

Hard drive speed is important though — standard speed is 7,200rpm, which is fine, considering the cost of faster drives, but SATA2

have it available as an option. Peripherals like DVD burners and card readers are useful, but hardly critical day-to-day.

All systems, regardless of their hardware make-up, should be able to be imaged, administered, patched and updated remotely from a central administrative point. You don't want to have too many



THE OS THAT FORMS THE PLATFORM FOR YOUR SOE HAS TO BE CAPABLE OF BEING MAINTAINED AND ADMINISTERED PROPERLY

is the chipset. It takes on great importance because an ideal system is small, quiet and low-power, which means that you're relying on the onboard capabilities of the motherboard. Any new system should support onboard USB 2.0, FireWire 400, SATA2, audio and VGA as a minimum.

Onboard VGA is completely acceptable. Yes, Vista's Aero interface does work much better on dedicated graphics cards, but the new Intel integrated graphics adaptors have a 3D engine capable of rendering Aero. Having said that, Aero's usefulness in the workplace is questionable. It looks great, but the Vista Basic theme also looks

should be mandatory. Screens are actually very important. Users will be looking at them all day every day, so they need to be as clear as possible. Resolution should be at least 1,280 x 1,024 as well as offering a good refresh rate. They should also be 4:3 screens (ie. not wide-screen). 16:9 and 16:10 screens look great, but they are not ideally suited to business apps and actually have a tendency to increase side-to-side eye movement, which can result in eye strain over an extended period.

Anything beyond these requirements are just "nice-to-haves". Gigabit Ethernet is pretty much standard now, and it's nice to

"physical touches" — where administrators and support staff have to physically go to the machine. Barring hardware failure, the ideal desktop is "zero touch" throughout its lifecycle. This keeps the TCO down and makes users much happier, as problems are much easier to solve and the system is more stable.

Vista offers great scope to achieve all these things and will make the foundation of a good business system. But, like any new tech, there are costs beyond the licensing fee. Assess the needs of your business and know that it's far more important to migrate well than to migrate quickly. [BPC](http://www.bpc.com)

BEST TECH



APC's independent reviewers point to the best technologies in the top-selling product categories each month. We only change products when a better one comes along. What you see here is the best technology available on the market.

Best Tech is edited by William Maher. Contributors to the APC Best Tech guide: Seamus Byrne, Dan Chiappini, John Gillooly, Ashton Mills, Nick Race, Tony Sarno, Adam Turner, Dan Warne, Chris Zammit and Stephen Withers.

The **Best Overall** award is for products we believe are the best, regardless of price.

The **Best Value** award is for those which offer a good combination of features for a reasonable price.

DESKTOP PCs – GENERAL USE

Enspire Digital Vitesse XP2

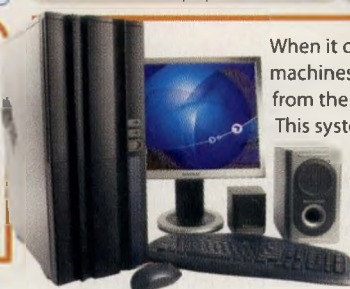
CONTACT Enspire Digital PHONE 1300 880 070
ONLINE www.enspiredigital.com.au PRICE \$2,687 (our spec)



We specced this machine on the Enspire site, with the right mix of features for work and play. Under the hood is Intel's flagship Core 2 Duo E6600 (2.4GHz) with 1GB of RAM, a Samsung 19in 8ms screen and GeForce 7600GT graphics card. Classy touches include the Logitech MX3000 Cordless Desktop set and Logitech 5.1 speakers.

PC Quest M2 Core

CONTACT PC Quest PHONE 1300 550 118
ONLINE www.pcquest.com.au PRICE \$1,510 (our spec)



When it comes to cheap, do-everything machines, there's a lot of rubbish out there from the big brands. Not so with PC Quest. This system has a dual-core Athlon 64 X2 3800+ on AMD's new AM2 platform, plus 1GB of RAM and a 19in LCD. Also, the ATI Radeon x1600 Pro is a capable card for occasional gaming.

DESKTOP PCs – SMALL BUSINESS

Dell OptiPlex 745 mini tower

CONTACT Dell PHONE 1800 812 393
ONLINE www.dell.com.au PRICE \$1,419 (our spec)



With Intel's new Core 2 Duo onboard, this represents the top of the line in a business computing platform. Key features include Core 2 Duo E6300 (1.8GHz) chip, 1GB DDR2 RAM, a 160GB Serial ATA hard drive, and 3-year next-business-day on-site warranty. Price includes 17in LCD monitor (analogue).

Dell OptiPlex GX520 mini tower

CONTACT Dell PHONE 1800 812 393
ONLINE www.dell.com.au PRICE \$1,269 (our spec)

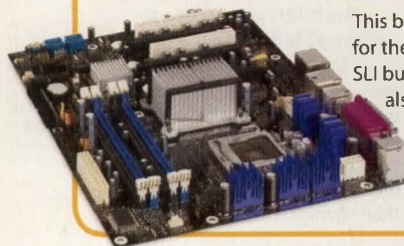


You'll get cheaper with Pentium 4 or Sempron, but we think it's time for dual-core. This Pentium D box beats big names like Lenovo for price (though ASI Solutions comes close). Our spec includes Pentium D 820 CPU, 512MB RAM, stable image and Dell OpenManage IT Assistant.

MOTHERBOARDS

Intel D975XBX

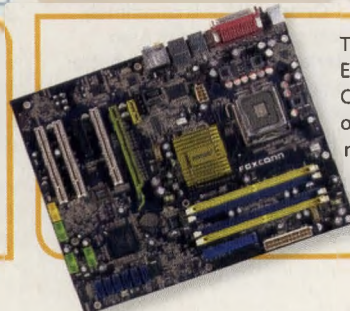
CONTACT Intel PHONE N/A
ONLINE www.intel.com PRICE \$315



This board is one of the finest you can get for the Core 2 Duo processors. It supports SLI but, thanks to the AMD/ATI buyout, it's also likely to be the last Intel board to officially support CrossFire graphics. While it lacks hardcore tweaking options, it shines when it comes to stability and performance.

Foxconn P9657AA-8KS2H

CONTACT Foxconn PHONE N/A
ONLINE www.foxconnchannel.com PRICE \$165

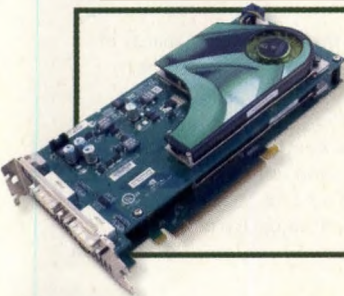


This board only has a single x16 PCI Express slot, so it can't be used for CrossFire or SLI. However, it also has one x1 and one x4 PCI slot ready for the next generation of PCI-E expansion cards. Combine this with HD audio, five SATA and one eSATA port and you've got top value for money.

VIDEO CARDS

Nvidia GeForce 7950 GX2

CONTACT Nvidia
ONLINE www.nvidia.com
PHONE N/A
PRICE Approx. \$800



This monster card combines two graphics chips connected via an internal PCI Express bridge. What this allows for is SLI-level performance out of a single card, while also giving you the option of using two of these on a suitable motherboard for truly obscene performance levels. Only serious gamers need apply.

Nvidia GeForce 7600 GT

CONTACT Nvidia
ONLINE www.nvidia.com
PHONE N/A
PRICE Approx. \$210



Nvidia's recently released mainstream card, the GeForce 7600 GT raises the bar for price/performance. With significant performance boosts over the last-generation 6600 GT card, the 7600 GT also comes with support for SLI, allowing performance to spiral even higher.

LCD MONITORS

Dell 2407WFP

CONTACT Dell
ONLINE www.dell.com.au
PHONE 1300 303 107
PRICE \$1,099



NEW ENTRY

If you're a gamer or entertainment lover with cash to drop on a new monitor, look no further. This model not only offers a gorgeous 24in wide-screen monitor but doubles as a low-cost entertainment screen and TV for console gaming in high-def. Its 450cd/m2 brightness and 1,000:1 contrast ratio are top-shelf.

BenQ FP71G+

CONTACT BenQ
ONLINE www.benq.com.au
PHONE (02) 9352 8800
PRICE \$329



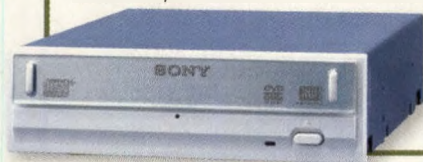
UPDATED

Proof that good things do come in small packages, this 17in LCD screen manages to remain at a low price point while still delivering an 8ms response time. There's no DVI, but this 1,280 x 1,024 monitor will satisfy most run-of-the-mill computing jobs with ease.

OPTICAL DRIVES – DVD

Sony DRU-820

CONTACT Sony
ONLINE www.sony.com.au
PHONE 1300 137 669
PRICE \$120



Sony's DRU-820 internal double-layer DVD burner is a ripper (if you'll excuse the pun), with support for DVD-RAM, DVD+/- and double-layer discs. It ships with Nero 6.6 and can write DVDs at up to 16x. A one-year warranty is included and the drive ships with both black and beige face-plates. An external model is also available for \$239.

Pioneer DVR-A11XL

CONTACT Pioneer Electronics
ONLINE www.pioneeraus.com.au
PHONE 1800 338 439
PRICE \$99



Now into its 11th-generation release, this DVD burner is a steal at \$99. Industry-leading NERO 7 Essentials burning software is included and the drive itself offers a zippy 16x burn speed. The Pioneer drive is an excellent upgrade for an ageing system and a solid alternative to Sony's model.

INTERNAL HARD DISKS

Seagate Barracuda 7200.10 750GB

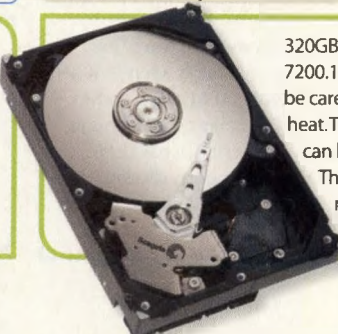
CONTACT Seagate
ONLINE www.seagate.com
PHONE (02) 9891 0087
PRICE \$980



It may not be on the shelves when this issue of APC hits the streets, but it won't be too far off. This 750GB whopper scored well in our benchmarks and — just think about it — you only need two of these for 1.5TB of storage! It's available in PATA and SATA, but who uses PATA these days?

Seagate Barracuda 7200.10 320GB

CONTACT Synnex
ONLINE www.synnex.com.au
PHONE 1300 100 100
PRICE \$225



320GB is the new black. Seagate's Barracuda 7200.10 is quiet and packs plenty of punch, but be careful in tight enclosures: it puts out a load of heat. Though the RRP for this drive is \$225, they can be found on the street for less than \$200. The 16MB cache model is fast enough for most uses, but if you're serious about video editing, splurge for a 10,000rpm drive.

EXTERNAL HARD DISKS

Maxtor OneTouch III Turbo Edition

CONTACT Maxtor PHONE (02) 9369 3662
ONLINE www.maxtor.com.au PRICE \$1,199 (1TB)



Power users looking to store files safely are advised to check out this external hard disk. The device offers FireWire 800, Firewire 400, USB 2.0 interfaces and up to 1TB of storage. RAID 0 and 1 arrays are supported and it ships with desktop backup software — no worries about trashed files.

Western Digital My Book

CONTACT Synnex PHONE 1300 100 100
ONLINE www.wdexternal.com.au PRICE \$299



With more than double the capacity of our previous best value drive (which was also WD) at only a slightly higher cost, here you get 250GB of storage in a classy black enclosure equipped with Google Desktop software for quick file finding. It's got USB 2.0 (and the smart power-on/off feature is a nice touch).

USB ULTRA-PORTABLE

Lexar Jumpdrive Lightning

CONTACT Lexar PHONE (02) 9034 8625
ONLINE www.lexar.com.au PRICE \$79.95 (1GB)



UPDATED

This ultra-quick Lexar functions like any other memory key, but includes a PowerToGo feature — you can install applications to the drive that can be run on any PC. It doesn't make any changes to the host OS and stores files locally on the key, so you can take it all with you when you leave; ideal for students or support staff. Support for 256-bit AES encryption is also included.

Sandisk Cruzer Micro

CONTACT Sandisk PHONE 1800 793 652
ONLINE www.sandisk.com PRICE \$47 (1GB)



UPDATED

Sandisk's Cruzer Micro is a top-notch USB memory key. The simple design includes a retractable USB connector and ships with a lanyard. The diminutive key includes the U3 software platform that allows users to install custom apps to the key — just like Lexar's PowerToGo feature. It's a touch slower than its competitor, but it's also \$20 cheaper for the 1GB capacity, and a good option for those that favour value over raw speed.

NAS / MEDIA

Iomega StorCenter Wireless Network 1TB

CONTACT Iomega PHONE 1800 466 342
ONLINE www.iomega.com.au PRICE \$1,999



The Iomega StorCenter provides a nominal terabyte of storage that can be configured as RAID 0, 1 or 5, plus Gigabit Ethernet, 802.11g wireless (WEP or WPA) and support for UPnP AV media players. Two USB ports enable connection for external drives, a shared printer or a digital camera.

Maxtor Shared Storage Plus

CONTACT Maxtor PHONE (02) 9369 3662
ONLINE www.maxtor.com.au PRICE \$399-\$699 (200GB-500GB)



Maxtor's Shared Storage Plus provides 200GB to 500GB of network storage, with the ability to stream media files to UPnP AV media adaptors — without the intervention of a PC. USB ports allow for connection of printers and external disk drives for additional storage.

SERVERS — SMALL BUSINESS

PowerEdge 2900

CONTACT Dell PHONE 1800 812 393
ONLINE www.dell.com.au PRICE From \$3,487



This Dell is a beauty. It's dual-socket, dual-core and sports up to two of the new Intel Woodcrest Xeon. The default config features a single Xeon 5140 at 2.33GHz with 1,333MHz FSB, backed by 2GB of DDR2 533 FB DIMMS and an 80GB SATA II hard drive. Dell offers a 3-year on-site warranty. Hugely upgradable, it has 12 FB DIMM slots and supports 48GB of RAM, eight internal SAS or SATA drive bays and can be racked.

HP ProLiant ML110 G3 SMB Bundle

CONTACT HP PHONE 1300 305 017
ONLINE www.hp.com.au PRICE \$1,499



Not a real powerhouse, but the price can't be beaten. This unit is a single CPU Pentium 4 3.0GHz with 1GB of RAM and two 80GB hard disk drives. Though it won't break any speed records, it will suit a small business's needs. The server is bundled with Microsoft Small Business Server 2003 Standard Edition.

NOTEBOOKS – MEDIA CENTRE

Sony Vaio VGNAR18GP

CONTACT Sony

PHONE 1300 137 669

ONLINE www.sony.com.au

PRICE \$5,499



It's not cheap, but if you're looking for one of the first Blu-ray-equipped notebooks, then this is it. You can burn and read the next-gen optical format (very slowly, mind you), as well as multiformat DVDs. Other highlights include the 160GB HDD, 3.8kg weight (lighter than Dell XPS M1710) and 17in-wide TFT.

Toshiba Qosmio G30

CONTACT Toshiba

PHONE 13 30 70

ONLINE www.isd.toshiba.com.au

PRICE \$4,299



Generous specs combined with an analogue/digital TV tuner and Media Center really does make this a portable entertainment device (if 4.6kg doesn't make your back cry). This puppy has enough graphics power to not only drive the gorgeous 17in LCD, but also to make current games look great.

NOTEBOOKS – BUSINESS

Lenovo ThinkPad X60

CONTACT Lenovo

PHONE 1300 557 073

ONLINE www.lenovo.com/au

PRICE From \$2,949



UPDATED

Business is all about portability — after all, there's no point having a notebook if you're hopping between power points all day. At 1.67kg and shipping with a better than average 8-cell battery, the X60's eight and a half hour run-time on a single charge will keep you going all day long.

Dell Inspiron 6400

CONTACT Dell

PHONE 1800 812 393

ONLINE www.dell.com.au

PRICE From \$1,329



UPDATED

It's impressive seeing Intel's Core Duo platform in a mid-sized package under \$1,500. Dell hasn't skimped heavily on other key features either, including a 15.4in wide-screen LCD. The 6400 will play and burn DVDs, and battery life is rated for three hours. Weight starts at 2.8kg.

NOTEBOOKS – ULTRA-PORTABLE

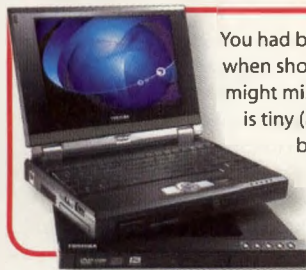
Toshiba Libretto

CONTACT Toshiba

PHONE 13 30 70

ONLINE www.isd.toshiba.com.au

PRICE From \$3,499



You had better make sure to look closely when shopping for a notebook or you might miss this one. At just 7.2in, the display is tiny (and the keyboard matches). Don't be fooled by the chassis though, there's plenty of grunt inside (and you can throw it into your backpack with room to spare).

Sony VGNTX27GPT

CONTACT Sony

PHONE 1300 138 246

ONLINE www.sony.com.au

PRICE \$3,699



The bigger brother of the TX17GP, we were blown away by its crisp display, tiny form factor and battery life. Able to run over eight hours on a single charge (and with an optional extended battery, there's no need to worry if you forget your charger).

SMARTPHONES

BlackBerry 8707G

CONTACT Optus

PHONE 1300 301 937

ONLINE www.optus.com.au

PRICE \$999 outright (or plan options)



This new BlackBerry has the basics perfected. A big, bright screen, fine-tuned QWERTY keyboard, 3G wireless that can be used as a laptop modem and the BlackBerry email service. Once you get the hang of the keyboard shortcuts, you can whip around the 8707G's interface like lightning.

Nokia E61

CONTACT Nokia

PHONE 1300 366 733

ONLINE www.nokia.com.au

PRICE \$749



It's hard to fault Nokia's 3G "BlackBerry Killer": it has the comfortable BlackBerry form factor with QWERTY keyboard and fits comfortably in your pocket — plus, you can take your pick of push email service. There are two other killer features: inbuilt Wi-Fi and Nokia's new web browser.

PRINTERS – HOME

Canon PIXMA iP5300 Bubble Jet printer

CONTACT Canon

PHONE 1800 021 167

ONLINE www.canon.com.au

PRICE \$249



This is the perfect all-rounder for the home. It prints high-quality photos and churns through mono text documents at speeds of up to 31ppm, with quality approaching that of a laser. It can also print directly to CDs and DVDs. The iP5300 will deal with school projects, digital photos, documents, anything!

Epson Stylus C79

CONTACT Epson

PHONE 1300 361 054

ONLINE www.epson.com.au

PRICE \$89



This is a cheap and cheerful printer that still delivers good results. With its four separate ink cartridges and extra-fine printing, it marries good print and photo quality with print speeds of up to 22ppm (black text) and 12ppm (colour). Be aware that your main ongoing cost will be the ink.

PRINTERS – SMALL BUSINESS

OKI C3400 LED Laser

CONTACT OKI

PHONE 1800 800 140

ONLINE www.oki.com.au

PRICE \$878



Essentially a high-performance colour laser for just over \$800. The OKI C3400 surpassed all the other sub-\$1,000 lasers in our recent Labs Challenge in print speed and quality because it uses slightly different LED laser technology. Consumable costs are slightly higher because the toner cartridges only do 1,000 pages, but it's a superior performer given the price.

Lexmark E120n

CONTACT Lexmark

PHONE (02) 8401 3000

ONLINE www.lexmark.com.au

PRICE \$188



The outstanding value of this package sent the APC office into raptures. The E120n is a 20ppm mono laser printer, with an Ethernet print server built in, for only \$188. Connect it to your ADSL modem/router and you can print wirelessly from anywhere in the house. Cartridges are not expensive.

MULTIFUNCTION – HOME

Canon Pixma MP830

CONTACT Canon

PHONE 1800 021 167

ONLINE www.canon.com.au

PRICE \$549



The MP780's successor, the MP830 soundly beats the competition. It can print photo-lab-quality 4 x 6in home snaps and has all the gear needed by a home office, such as a copier, scanner and G3 fax machine (together with an automatic 35-page document feeder and duplexing ability).

Lexmark X5470

CONTACT Lexmark

PHONE (02) 8401 3000

ONLINE www.lexmark.com.au

PRICE \$249



This Lexmark is probably the first attempt to create an MFC that actually looks stylish. But the machine also performs well, with print speeds up to 25ppm black and 18ppm colour, a 10-sheet automatic document feeder, plus PC-free photo, fax and copy capabilities.

MULTIFUNCTION – SMALL BUSINESS

EPSON Aculaser CX11NF

CONTACT EPSON

PHONE 1300 361 054

ONLINE www.epson.com.au

PRICE \$1,499



This colour laser multifunction printer won three of the six tests thrown at several MFCs in a recent APC Labs Challenge. Has good copy and scan speed, and does a great job with plain paper, where its fine detail and accurate colour impressed the judges. It can really replace your office printer, copier and fax machine.

Brother MFC-8860DN

CONTACT Brother

PHONE (02) 9887 4344

ONLINE www.brother.com.au

PRICE \$1,199



A mono (rather than colour) laser, this still has all the components to make it a powerful office or small department performer — such as a 28ppm network laser printer, a copier and a scanner with built-in duplexing, as well as LDAP capability (for accessing directory services). A great all-rounder for small businesses at the price.

ADSL2+ MODEM/ROUTERS

Billion 7404VGP

CONTACT PC Range
 PHONE (08) 8322 9544
 ONLINE www.billion.com.au
 PRICE \$299



It's hard to beat on features and price. For your \$299, you get one of the fastest ADSL2+ modems in terms of actual throughput (average over 1 km and 3.5km phone line length), robust 802.11g wireless networking (supporting WPA2 security) and four Ethernet ports. There's inbuilt VoIP and PSTN passthrough (if the VoIP ever fails).



Billion 7300G

CONTACT PC Range
 PHONE (08) 8322 9544
 ONLINE www.billion.com.au
 PRICE \$169



Despite its low price, the Billion 7300G managed to trump all the other modems in our most recent ADSL2+ Labs Challenge on average speed across 1km and 3.5km line lengths. It includes four 10/100 ports as well as 802.11g (including WEP, WPA and WPA-2 security). The modem has configurable Quality of Service, too.



WIRELESS APs AND ROUTERS

Linksys Wireless-N Broadband Router WRT300N

CONTACT Linksys
 PHONE 1800 678 808
 ONLINE www.linksys.com.au
 PRICE \$279.95



We're still not overly convinced that Draft N devices are the best devices in the long term, but if you want more speed for now, at least it gives you a chance of compatibility between brands and some hope of a firmware upgrade further down the track. The WRT300N has the best range among the Draft N routers we've tested so far.

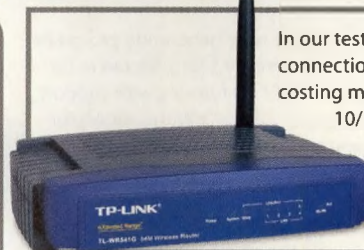


TP-Link TL-WR541G

CONTACT Anyware
 PHONE 1300 269 927
 ONLINE www.anyware.com.au
 PRICE \$75



In our tests the TL-WR541G delivered solid connections at the same range as routers costing much more. It has the usual four-port 10/100 Ethernet switch plus regular features such as a (relatively simple) firewall, access controls, WPA2 authentication, DHCP and port triggering.



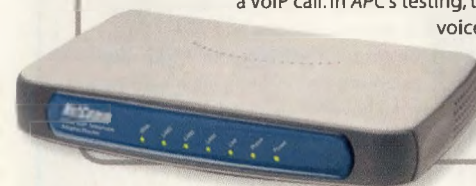
VOIP ADAPTORS

Netcomm V300

CONTACT NetComm
 PHONE (02) 9424 2070
 ONLINE www.netcomm.com.au
 PRICE \$199



Low upstream speeds on most broadband connections mean QoS support makes a big difference to how you sound during a VoIP call. In APC's testing, the V300 delivered good voice quality with minimum impact on data traffic. It also lets you use one handset for VoIP and PSTN calls.



Netcomm V100

CONTACT NetComm
 PHONE (02) 9424 2070
 ONLINE www.netcomm.com.au
 PRICE \$128



Connect the V100 to a power point, your network and a handset, and you're in business. Available as a generic model or preconfigured for certain VoIP providers, which makes it as simple as it gets. Some people prefer a box that allows more diddling around, but we're attracted to the simplicity.



GPS DEVICES

TomTom GO 910

CONTACT TomTom
 PHONE N/A
 ONLINE www.tomtom.com
 PRICE \$1,179



Feature-crammed, with a 480 x 272 pixel TFT LCD touchscreen, 3D navigation software, maps of three continents on its 20GB hard disk and countless route options and points of interest. Best of all is its lightning-fast reaction time, immediately picking unexpected route changes and aligning maps quickly.



Navman N40i

CONTACT Navman Australia
 PHONE (02) 9879 900
 ONLINE www.navman.com
 PRICE \$899



The N Series takes up the NavPix "image-based navigation" theme and delivers it in an even smaller package. Compared to the N60i it has a smaller colour touchscreen and less flash memory. But, with an RRP of \$899, it has to be one of the best value GPS in-car units on the market.



DIGITAL STILL CAMERAS

Canon PowerShot G7

CONTACT Canon
PHONE 13 13 83
ONLINE www.canon.com.au
PRICE \$899



Here is an excellent example of the power you can get without dropping all your dough on a DSLR. Short of interchangeable lensing, the G7 still delivers excellent manual controls and a wealth of features unmatched by most of the non-SLR digital market. Very big prints are viable with its 10MP resolution.

Panasonic Lumix DMC-FX01

CONTACT Panasonic
PHONE 13 26 00
ONLINE www.panasonic.com.au
PRICE \$549



The Lumix camera range features excellent Leica lensing, and the FX01 delivers a wide-angle 28mm lens with a zoom range out to 102mm. For the money spent, you're getting 6MP resolution along with some first-rate optical stabilisation. The 2.5in LCD is extremely bright.

DIGITAL VIDEO CAMERAS

Panasonic AG-HVX202EN

CONTACT Panasonic
PHONE 13 26 00
ONLINE www.panasonic.com.au
PRICE \$9,900



The first of the next-generation pro-grade cameras (and inside \$10K). Record in DV or various DVCPRO formats, with support for 720p and 1080i HD. With support for DV tape and the new P2 flash media format, as well as pro audio features and new lensing technology, this is nova hot right now.

Sony HDRSR1

CONTACT Sony
PHONE 1300 137 669
ONLINE www.sony.com.au
PRICE \$2,499



Finally, a hard drive handycam which delivers high definition that goes beyond HDV. The new AVCHD format is excellent, with variable bit rates to suit your different shooting needs. Plus, there is also great buffer features and hard disk shock protection to ensure a long (healthy) life for your investment.

PROJECTORS

Optoma HD72

CONTACT Amber Technology
PHONE 1800 251 367
ONLINE www.ambertech.com.au
PRICE \$4,750



Optoma's outstanding DLP-based projector offers full 720p HD resolution for less than \$5,000. The 3.1kg unit produces a clear, consistent image with controls to adjust brightness, contrast, image shift and keystone, through dedicated buttons on the remote control. This saves hunting through menus to make changes to picture properties and helps the viewer adjust the image to match each movie.

Toshiba S8 DLP

CONTACT Toshiba
PHONE (02) 9887 6000
ONLINE www.toshiba.com.au
PRICE \$1,999

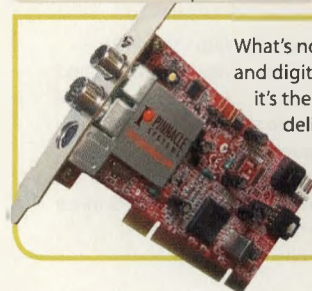


If you're after a basic projector to handle some gaming, movies and web surfing, the S8 is a safe bet. It has 800 x 600 pixel resolution, 2,000:1 contrast ratio, and composite, S-Video and VGA inputs. Better still, the maximum 3,000-hour (economy mode) lamp life means you won't have to buy pricey bulbs every few months.

TV TUNERS

Pinnacle PCTV 310i

CONTACT Lako Pacific
PHONE (03) 9455 7444
ONLINE www.lakopacific.com
PRICE \$199.99



What's not to like about the 310i? With analogue and digital TV tuners (plus FM radio) on one card, it's the complete package. The software delivers PVR features with recording to DivX or MPEG-2 files, or direct to DVD. A remote control is included; there's even an S-Video/composite input to digitise analogue home videos.

Compro VideoMate U500

CONTACT Anyware
PHONE 1300 269 927
ONLINE www.anyware.com.au
PRICE \$99



The Compro VideoMate U500 is a USB dongle, so you can use it with desktops or notebooks (but you may need a better antenna than the one included in order to receive all channels). Scheduled recording is easy enough to set up, plus it's possible to record directly to a DVD or an ISO.

Psssst... ...wanna buy a notebook?

IT'S THE FASTEST WAY TO FIND THE BEST PC GEAR IN AUSTRALIA!

APC's Best Tech list is now online at www.apcmag.com/BestTech. Get all our inside tips on the best notebooks, LCD TVs, modems, printers and more.

We got sick of our neighbours/brothers/cousins bugging us for info about the best gear to buy, so now we're posting it all online: our favourite killer products across 50 categories.

About to buy a family PC?

We've got the essential picks, including the best all-round systems on the market today (and decent cheapies that won't run like a dog).

Want an iPod alternative?

We're always on the lookout for the next iPod killer. (Coincidentally, we also have hate mail from Apple fans.)

We just list the best stuff, so you don't spend ages trawling through millions of web reviews.

Oh, and did we mention you can post your own comments and read what other people are saying? So — get online and get involved!

50 CATEGORIES
OF THE BEST
TECH GEAR



FROM AUSTRALIA'S LONGEST-RUNNING PC MAGAZINE LAB

MEDIA ADAPTORS

Zenonic Z500 HD Network DVD player

CONTACT Zenonic PHONE (08) 8322 9544
ONLINE www.zenonic.com.au PRICE \$569



If you want to get your digital media from the study to the lounge room, the Z500 can handle anything you throw at it. It's a progressive-scan MPEG4/DVD player with HDCP-compatible HDMI, plus built-in Ethernet and 802.11b/g for streaming internet access and playing music, photos and movies from any PC on your home network.



Mediagate MG-350HD

CONTACT Anyware Computers PHONE (03) 9763 8200
ONLINE www.anyware.com.au PRICE \$399



The Mediagate MG-350HD is one of the simplest ways to get high-definition action into your lounge room (up to 1,080p resolution). Whack a desktop hard drive inside and the Mediagate plays just about any audio, video or image file you care to throw at it — from the drive or via Ethernet or Wi-Fi.



HD TVs

Sony Bravia KDL40X2000

CONTACT Sony PHONE 1300 720 071
ONLINE www.sony.com.au PRICE \$5,499



The Bravia is set apart from the competition by its signature styling, featuring a "floating glass" design — this screen looks expensive, and it is. This is full HD resolution of 1,920 x 1,080, unlike some cheaper value screens (see Acer's value range). For the price, you're also getting an integrated HD digital tuner and 2 HDMI inputs.



Acer AT3705-DTV

CONTACT Acer PHONE 1300 362 328
ONLINE www.acer.com.au PRICE \$2,899



Sure, it's not a traditional audio-visual brand, but Acer are definitely good value. For less than \$3,000 you're getting a 37in full HD resolution (1,920 x 1,080) LCD screen including analogue and digital TV tuners.



PERSONAL VIDEO RECORDERS

Topfield TF5000PVRT Masterpiece

CONTACT Topfield PHONE 1300 889 803
ONLINE www.topfield.com.au PRICE \$999



If you're ready to revolutionise your TV viewing, this'll let you skip ads, pause live TV and record two programs at once. It sports twin SD digital tuners and a 160GB hard drive, plus the Ice TV Electronic Program Guide lets you "set and forget" the Masterpiece and never miss your favourite show again.



Legend Digital LPVR080

CONTACT Legend Digital PHONE (02) 8223 9656
ONLINE www.legenddigital.com PRICE \$600



The Legend Digital LPVR080 also sports twin standard-definition digital tuners along with an 80GB hard drive (up to 400GB is available). Along with PVR features like pausing live TV and ICE TV-compatibility, it lets you copy across MP3 and JPEG files from your computer via USB so

you can play them on your TV and stereo.



PORTABLE MUSIC PLAYERS

iPod 80GB

CONTACT Apple PHONE 13 36 22
ONLINE www.apple.com.au PRICE \$499



Now this is getting really mental. Truly an insane amount of storage (20,000 songs), which is enough to knock Creative's Zen Vision: M off the top of our list. The screen is now brighter and gives up to 20 hours of battery life. It's not cheap, but yet again, Apple's iPod is the best.



iPod shuffle 1GB

CONTACT Apple PHONE 13 36 22
ONLINE www.apple.com.au PRICE \$119



We're not turning into iPod fanboys, but for RRP value we still can't go past the shuffle, which has had a design overhaul and a price cut. It's now so small that fashion models must use their fingertips to hold it in press photos. 1GB of memory gives you up to 240 songs.



PowerTel launches another ADSL2+ network

Another telco has now launched a major ADSL2+ network offering broad coverage. Dan Warne reports.

PowerTel is the latest telco company to launch ADSL2+ across 290 telephone exchanges, after having combined iiNet and PowerTel's two separate networks (following a major investment in iiNet by PowerTel).

West Australian ISP Westnet is the first provider to publicly announce it is launching national ADSL2+ services to its 115,000 customers through PowerTel's infrastructure. However, Victorian ISP Netspace's announcement last month that it would be offering the broadest ADSL2+ coverage of any ISP suggests it will be using both PowerTel and Optus infrastructure, as well as some of its own DSLAMs.

PowerTel's 290 exchanges may not sound like a lot (considering there are nearly 5,000 telephone exchanges around Australia), but

PowerTel claims this gives it complete coverage in all major metropolitan capital cities around Australia. It's almost as big as Optus' ADSL2+ rollout and 70 exchanges short of Telstra's.

WATCH THE SPEED LIMIT

Despite the enthusiastic offerings of higher-speed broadband by Telstra's competitors, the ACCC has warned ADSL2+ broadband ISPs to not be overly optimistic in advertising about the speed customers can expect to receive.

Chief of the competition regulator, Graeme Samuels, says that providers advertising headline speeds of "24Mbit/s" or even "up to" those speeds should be very careful, as consumers may feel misled if their connection speed is nowhere near that.

Telstra has opted to market a more conservative 20Mbit/s maximum speed for its new ADSL2+ network and also quotes the percentage of people that are likely to get close to that speed.

Internode managing director Simon Hackett said he was very comfortable advertising speeds of up to 24Mbit/s. "We do routinely see customers achieving 24Mbit/s. In fact, the max possible speed on ADSL2+ is closer to 29 megabits per second, though only at very short line lengths." Internode has also advertised its ADSL2+ plans as "minimum 1,500/256, maximum 24,000/1000" for some time.

iiNet managing director Michael Malone cited statistics compiled by Whirlpool users, showing that of 121 people, over 30 per cent got over 20Mbit/s.

in brief

ADSL2+ FOR \$39.95

A little-known ISP, Lets Go, has announced a deal to resell Optus ADSL2+ at a staggeringly low price: \$39.95, with a whopping 60GB download limit. To get the deal, you also have to switch your line rental over to Lets Go, but it is only \$30.95 per month, which is similar to that charged by most telcos (except Telstra, which offers a \$19.95 line rental).



BRISBANE TO GET FIBRE BROADBAND

Queensland Premier Peter Beattie has announced a forward-thinking plan to install 100Mbit/s fibre-optic broadband to every premise in metropolitan Brisbane, at a cost of \$550 million. A private company will have to stump up the cash and then on-sell access to ISPs with guarantees of neutrality written into the contract (to avoid the anti-competitive behaviour of which Telstra has been accused).

I promise fibre-optic broadband to every premise in metropolitan Brisbane... trust me.



your monthly broadband guide

APC is proud to partner with the independent broadband price-monitoring service Broadband Choice (broadbandchoice.com.au) to bring you the best ADSL and cable deals.

The comparison table on the following pages focuses on internet service providers that best serve the majority of APC readers' needs — those that have national coverage (though we have included some ISPs that provide higher than 2Mbit/s speed services in limited areas). Only those meeting at least three of our four plan selection criteria are listed:

Budget plan: cheapest deal under \$35/month.

Light plan: cheapest deal under \$60/month, with at least 512Kbit/s speed and 1GB data.
Family plan: largest download allowance under \$80/month, at least 512Kbit/s and 10GB data.
High-speed: cheapest 1.5Mbit/s plan under \$100/month, with 10GB data minimum.

If an ISP has "unlimited downloads" but speed is throttled after reaching a certain limit, the portion in which you can get full-speed downloads is listed as its limit.

APC has picked the lowest price for a contract period of six months or less for broadband installation. Otherwise, the lowest-priced option was selected.

The installation price doesn't include a modem because you may find you'll get better value by buying one separately.

Can't find your provider in our list? That's because some of the largest ISPs, and many smaller ones, didn't meet the selection criteria we use. There may be ISPs we didn't list that will provide better deals (but which only service your local area or state).

ISPs enter their own information into the Broadband Choice database. ISPs can contact bc@whirlpool.net.au for more details on how to become part of the database.

Data for our table was extracted from the Broadband Choice database on 22 November 2006.



Name	Phone	Online	Budget plan (under \$35)	Light plan (under \$60, at least 512Kbit/s, minimum 1GB data limit)	Family plan (under \$80, at least 512Kbit/s, minimum 10GB data limit)	High-speed plan (under \$100, at least 1.5Mbit/s, minimum 10GB data limit)	National	Spam filtering	Setup fee and contract length	Rapid transfer
Super-fast broadband ISPs (faster than 1.5Mbit/s)										
HostCore DSL2	1300 781 097	www.hostcoredsl.com.au	\$29.95† 1GB 24Mbit/s	\$29.95† 1GB 24Mbit/s	\$69.95† 50GB 24Mbit/s	\$49.95† 10GB 24Mbit/s	✓	✓	\$1.95 \$149.95 1mth	✓
i!Net broadband2+ ADSL (24Mbit)	13 19 17	www.iinet.net.au	\$29.95† 500MB+ 24Mbit/s	\$39.95† 1GB 3Mbit/s	\$69.95† 20GB+ 24Mbit/s	\$59.95† 10GB+ 24Mbit/s	✓	✓	\$79.95 6mths	✓
Internode Extreme ADSL2+	13 66 33	www.internode.on.net	N/A	\$59.95 20GB 24Mbit/s	\$79.95 40GB 24Mbit/s	\$59.95 20GB 24Mbit/s	✓	✓	\$129 6mths	✓
Letsgo Go ADSL2+ 24Mbit	1300 556 114	www.letsgo.com.au	N/A	\$39.95† 60GB 24Mbit/s	\$39.95† 60GB 24Mbit/s	\$39.95† 60GB 24Mbit/s	✓	✓	\$50 12mths	✓
OptusNet Cable	1800 504 504	http://broadbandsales. optusnet.com.au	\$29.95† 300MB+ 9.765625Mbit/s	\$39.95† 2GB+ 9.765625Mbit/s	\$69.95† 20GB+ 9.765625Mbit/s	\$69.95† 20GB+ 9.765625Mbit/s	✓	✓	\$89 12mths	✓
OptusNet DSL Direct	1800 504 504	http://broadbandsales. optusnet.com.au	\$29.95† 300MB+ 24Mbit/s	\$39.95† 2GB+ 24Mbit/s	\$69.95† 20GB+ 24Mbit/s	\$69.95† 20GB+ 24Mbit/s	✓	✓	\$89 12mths	✓
Primus up to 8,000Kbps	1300 850 000	www.primus.com.au	\$29.95† 1GB 8Mbit/s	\$29.95† 1GB 8Mbit/s	\$69.95† 20GB 8Mbit/s	\$59.95† 10GB 8Mbit/s	✓	✓	\$118 1mth	✓
Telstra BigPond Cable	13 12 82	www.bigpond.com	\$29.95† 200MB+ 7.8125Mbit/s	\$59.95† 10GB+ 7.8125Mbit/s	\$59.95† 10GB+ 7.8125Mbit/s	\$59.95† 10GB+ 7.8125Mbit/s	✓	✓	\$2.50 \$189 12mths#	✓
TPG Residential ADSL2+	1300 360 855	www.tpg.com.au	\$29.99* 600MB 24Mbit/s	\$39.99 3GB 24Mbit/s	\$59.99 30GB 24Mbit/s	\$49.99 18GB 24Mbit/s	✓	✓	\$59.95 12mths	✓
Regular broadband ISPs (1.5Mbit/s or less)										
1 2 3 ADSL	1300 885 646	www.123.net.au	\$29.99† 200MB 256Kbit/s	\$49.99† 1.5GB 512Kbit/s	\$69.99† No limit 512Kbit/s	N/A	✓	✓	\$129 6mths	✓
asNet ADSL	1300 665 076	www.asnet.net.au	\$27.90* 1GB 256Kbit/s	\$33.50* 1GB 512Kbit/s	\$74.90* 36GB 1.5Mbit/s	\$64.90* 16GB 1.5Mbit/s	✓	✓	\$145 6mths	✓
asNet ADSL	1300 665 076	www.asnet.net.au	\$24.90* 1GB 256Kbit/s	\$29.50* 1GB 512Kbit/s	\$69.90* 36GB 1.5Mbit/s	\$59.90* 16GB 1.5Mbit/s	✓	✓	\$145 12mths	✓
AAPT ADSL	13 88 88	www.aapt.com.au	\$29† 500MB 256Kbit/s	\$39† 12GB 512Kbit/s	\$59† 15GB 1.5Mbit/s	\$59† 15GB 1.5Mbit/s	✓	✓	\$0 1mth	✓
Accesoft Freeway ADSL	1300 881 668	www.onmyweb.net	N/A	\$52.95† 1.5GB 512Kbit/s	\$75.95† 15GB 512Kbit/s	\$98.95† 10GB 1.5Mbit/s	✓	✓	\$132 6mths	✓
AuNix Broadband	1300 765 742	www.aunix.com.au	\$24.95† 15GB 256Kbit/s	\$34.95† 25GB 512Kbit/s	\$74.95† 35GB 1.5Mbit/s	\$74.95† 35GB 1.5Mbit/s	✓	✓	\$99 1mth	✓
Auritel Broadband	1300 669 254	www.auritel.com.au	N/A	\$59.95 25GB 512Kbit/s	\$59.95 25GB 512Kbit/s	\$89.95 35GB 1.5Mbit/s	✓	✓	\$129 6mths	✓
Aussiemids Residential ADSL	1300 556 491	www.aussiemids.com	N/A	\$59.95 30GB 512Kbit/s	\$99.95 30GB 512Kbit/s	\$99 30GB 1.5Mbit/s	✓	✓	\$110 6mths	✓
Australia On Line ADSL	1300 650 661	www.australiaonline.net.au	\$16.99* 200MB 256Kbit/s	\$36.95 2GB 512Kbit/s	\$54.95 No limit 512Kbit/s	\$94.95 No limit 1.5Mbit/s	✓	✓	\$99 6mths	✓
B Digital ADSL	13 33 44	www.mysoul.com.au	\$34.95† 5GB 256Kbit/s	\$44.95† 5GB 512Kbit/s	\$79.95† 10GB 1.5Mbit/s	\$79.95† 10GB 1.5Mbit/s	✓	✓	\$119 6mths	✓
BIT.net	1300 246 638	www.bit.net.au	\$19.95† 2GB 256Kbit/s	\$29.95† 2GB 512Kbit/s	\$69.95† 40GB 512Kbit/s	\$59.95† 10GB 1.5Mbit/s	✓	✓	\$132 6mths	✓
BKB Internet Home ADSL	1800 252 638	www.bkb.net.au	N/A	\$49.95 1GB+ 512Kbit/s	\$64.95 10GB+ 512Kbit/s	\$89.95 10GB+ 1.5Mbit/s	✓	✓	\$139 6mths	✓
Blacklump ADSL	1800 890 600	www.blacklump.net.au	\$19.95† 200MB 256Kbit/s	\$44.95† 5GB 512Kbit/s	\$55.95† No limit 512Kbit/s	\$72.45† 10GB 1.5Mbit/s	✓	✓	\$108 6mths	✓
Bluemaxx ADSL	1300 791 990	www.bluemaxx.net.au	\$24.95* 200MB 256Kbit/s	\$54.95 5GB 512Kbit/s	\$74.95 30GB 512Kbit/s	\$84.95 10GB 1.5Mbit/s	✓	✓	\$105 12mths	✓
BBI Flat Rate DSL	1300 785 956	www.browbear.net.au	\$32.95 2GB 256Kbit/s	\$39.95 2GB 512Kbit/s	\$74.95 60GB 512Kbit/s	\$81.95 15GB 1.5Mbit/s	✓	✓	\$119 6mths	✓
BBI Excess DSL	1300 785 956	www.browbear.net.au	\$19.95† 1GB 256Kbit/s	\$29.95† 1GB 512Kbit/s	\$69.95† 60GB 512Kbit/s	\$76.95† 15GB 1.5Mbit/s	✓	✓	\$119 6mths	✓
Brown Bear DSL/Phone	1300 785 956	www.browbear.net.au	\$34.95* 500MB 256Kbit/s	\$49.95* 5GB 512Kbit/s	\$69.95* 25GB 512Kbit/s	N/A	✓	✓	\$150 12mths	✓
Bullet ADSL	1300 137 454	www.bullet.net.au	\$29.95* 200MB 256Kbit/s	N/A	\$79.95 10GB 512Kbit/s	\$99.95 10GB 1.5Mbit/s	✓	✓	\$99 1mth	✓
CEInternet Broadband	1800 222 256	www.ceinternet.com.au	\$34.95† 500MB 256Kbit/s	\$54.95† 1GB 512Kbit/s	\$64.95† 10GB 512Kbit/s	N/A	✓	✓	\$132 6mths	✓
Central Coast Internet ADSL	1300 730 947	www.cci.net.au	\$19.95* 200MB 256Kbit/s	\$39.95† 1GB+ 512Kbit/s	\$79.99 No limit 512Kbit/s	\$69.99* 15GB+ 1.5Mbit/s	✓	✓	\$99 6mths	✓
Comcon Internet	1300 300 324	www.comcon.com.au	\$29.95* 500MB 256Kbit/s	\$39.95† 1GB 512Kbit/s	\$69.95 No limit 512Kbit/s	\$79.95† 15GB 1.5Mbit/s	✓	✓	\$99 6mths	✓
Concept Networks ADSL	1300 132 331	www.conceptual.net.au	\$27.95* 200MB+ 256Kbit/s	\$59.95 10GB+ 512Kbit/s	\$59.95 10GB+ 512Kbit/s	N/A	✓	✓	\$149 6mths	✓
Connexus Home ADSL	1300 133 888	www.connexus.net.au	\$19.95† 200MB+ 256Kbit/s	\$49.95† 5GB 512Kbit/s	\$59.95† No limit 512Kbit/s	\$69.95† 15GB 1.5Mbit/s	✓	✓	\$99 6mths	✓
CyberOne ADSL	1300 720 062	www.cyberone.com.au	\$21.95† 200MB 256Kbit/s	\$46.95† 5GB 512Kbit/s	\$57.95† No limit 512Kbit/s	\$79.95† 10GB 1.5Mbit/s	✓	✓	\$99 6mths	✓
Cyberspace Internet ADSL	1300 138 977	www.cyberspace.net.au	\$29.95 500MB 256Kbit/s	\$49.95 10GB 512Kbit/s	\$59.95 20GB 512Kbit/s	\$79.95 20GB 1.5Mbit/s	✓	✓	\$125 6mths	✓
DCSI	1300 665 575	www.dcsi.net.au	\$19.95† 10GB 256Kbit/s	\$42.95† 5GB 512Kbit/s	\$49.95† 10GB 512Kbit/s	\$89.95† 10GB 1.5Mbit/s	✓	✓	\$99 1mth	✓
DigiPlus	1300 765 600	www.digipus.com.au	\$19.90† 250MB+ 256Kbit/s	\$34.90† 1GB+ 512Kbit/s	\$44.90† No limit 512Kbit/s	\$64.90† 30GB+ 1.5Mbit/s	✓	✓	\$119 1mth	✓
Dodo	13 24 73	www.dodo.com.au	\$26.95* 200MB+ 256Kbit/s	N/A	\$69.95 10GB+ 512Kbit/s	\$95.95 10GB+ 1.5Mbit/s	✓	✓	\$100 6mths	✓
DragNet Budget ADSL	1800 069 050	www.dragnet.com.au	N/A	\$54.95† 1.5GB 512Kbit/s	\$74.95 15GB 512Kbit/s	\$95.95 10GB 1.5Mbit/s	✓	✓	\$100 6mths	✓
DragNet Power ADSL	1800 069 050	www.dragnet.com.au	N/A	\$29.95† 400MB+ 256Kbit/s	\$49.95† No limit 512Kbit/s	\$79.95† 40GB 512Kbit/s	✓	✓	\$125 1mth	✓
EFTel ADSL	1300 550 550	http://w3.eftel.com	\$19.95† 200MB 256Kbit/s	\$39.95† 1GB 512Kbit/s	\$69.95† 15GB 1.5Mbit/s	\$69.95† 15GB 1.5Mbit/s	✓	✓	\$99 12mths	✓
eTelecom ADSL	1300 303 217	www.etelecom.com.au	\$30.80* 200MB 256Kbit/s	N/A	\$69 10GB 512Kbit/s	\$89.95 10GB 1.5Mbit/s	✓	✓	\$120 3mths	✓
ezConnect ADSL	1300 303 637	www.ezconnect.com.au	\$29.99* 200MB 256Kbit/s	\$49.90 5GB 512Kbit/s	\$69.90† 20GB 512Kbit/s	\$79.90 10GB 1.5Mbit/s	✓	✓	\$99 6mths	✓
Fonebox ADSL Broadband Internet	1800 366 328	www.fonebox.com.au	\$31.95* 200MB 256Kbit/s	\$49.95 1.5GB 512Kbit/s	\$73.95 15GB 512Kbit/s	N/A	✓	✓	\$99 6mths	✓
FutureWeb ADSL	1300 361 355	www.futureweb.com.au	\$29.95* 300MB 256Kbit/s	\$49.95 2GB+ 512Kbit/s	\$79.95 No limit 512Kbit/s	\$89.95 14GB+ 1.5Mbit/s	✓	✓	\$99 6mths	✓
Global Dial ZapDSL	1300 130 710	www.globaldial.com	\$28.95* 200MB 256Kbit/s	\$65 1.5GB 512Kbit/s	\$80 15GB 512Kbit/s	N/A	✓	✓	\$139 1mth	✓
Goldweb ADSL	1300 366 065	www.goldweb.com.au	N/A	\$95 40GB 512Kbit/s	\$77 100GB 512Kbit/s	\$96 80GB 1.5Mbit/s	✓	✓	\$132 6mths	✓
Green Tree Frog ADSL	1300 854 820	www.greentreefrog.net.au	N/A	\$55* 40GB 512Kbit/s	\$77* 100GB 512Kbit/s	\$99* 80GB 1.5Mbit/s	✓	✓	\$132 6mths	✓
Green Tree Frog Business ADSL	1300 854 820	www.greentreefrog.net.au	N/A	\$32.95 500MB+ 256Kbit/s	\$44.95 1.5GB+ 512Kbit/s	\$79.95 30GB+ 512Kbit/s	\$84.95 10GB+ 1.5Mbit/s	✓	\$119.95 1mth	✓
Hande Communications ADSL Shaped	1300 306 131	www.hande.net.au	\$32.95* 500MB+ 256Kbit/s	\$44.95* 1.5GB+ 512Kbit/s	\$69.95* 15GB+ 512Kbit/s	\$89.95* 15GB+ 1.5Mbit/s	✓	✓	\$119.95 1mth	✓
Hande Communications ADSL Usage Based	1300 306 131	www.hande.net.au	\$29.95* 250MB+ 256Kbit/s	\$49.95† 1GB+ 512Kbit/s	\$69.95 25GB+ 512Kbit/s	\$89.95 20GB+ 1.5Mbit/s	✓	✓	\$99 12mths	✓
Hugobit Home ADSL Broadband	1800 424 683	www.hugobit.com.au	\$29.95† 500MB+ 256Kbit/s	\$49.95 2GB 512Kbit/s	\$69.95 10GB 512Kbit/s	\$99.95 15GB 1.5Mbit/s	✓	✓	\$79.95 6mths	✓
i!Net broadband1 ADSL	13 19 17	www.iinet.net.au	N/A	N/A	N/A	N/A	✓	✓	N/A	✓

Name	Phone	Online	Budget plan (under \$35)	Light plan (under \$60, at least 512Kbit/s, minimum 1GB data limit)	Family plan (under \$80, at least 512Kbit/s, minimum 10GB data limit)	High-speed plan (under \$100, at least 1.5Mbit/s, minimum 10GB data limit)	National	Spam filtering	Setup fee and contract length	Rapid transfer
Regular broadband ISPs (1.5Mbit/s or less)										
ISP ADSL	1300 304 288	www.isp.net.au	\$29.70* 800MB 256Kbit/s	\$39.80* 5GB 512Kbit/s	\$77 No limit 512Kbit/s	\$69.30* 25GB 1.5Mbit/s	✓	✓	\$132 6mths	✓
Infinity Plus Residential DSL	1300 726 340	www.infinityplus.net.au	N/A	\$54.95† 25GB 512Kbit/s	\$54.95† 25GB 512Kbit/s	\$84.95† 30GB 1.5Mbit/s	✓	✓	\$100 6mths	✓
Instant Communications ADSL	1300 139 369	www.in.com.au	\$30* 200MB 256Kbit/s	\$52 5GB 512Kbit/s	\$73* 20GB 512Kbit/s	\$87* 10GB 1.5Mbit/s	✓	✓	\$99 6mths	✓
IntegrifyNet ADSL	1300 884 337	www.integrifynet.com.au	\$29.95* 200MB 256Kbit/s	\$59.95* 5GB 512Kbit/s	\$69.95* 10GB 512Kbit/s	\$99.95* 10GB 1.5Mbit/s	✓	✓	\$139 12mths	✓
Internode Home ADSL	13 66 33	www.internode.on.net	\$29.95 500MB 256Kbit/s	\$39.95 8GB 512Kbit/s	\$69.95 40GB 512Kbit/s	\$59.95 10GB 1.5Mbit/s	✓	✓	\$129 6mths	✓
Internode SOHO ADSL	13 66 33	www.internode.on.net	N/A	\$59.95 10GB 512Kbit/s	\$69.95 20GB 512Kbit/s	\$79.95 10GB 1.5Mbit/s	✓	✓	\$129 6mths	✓
Interworks ADSL	1300 720 207	www.interworks.net.au	\$34.95* 1GB 256Kbit/s	\$49.95* 5GB 512Kbit/s	\$79.95 No limit 512Kbit/s	\$99.95* 25GB 1.5Mbit/s	✓	✓	\$119 3mths	✓
iSage Internet ADSL	1300 725 789	www.isage.aunz.net	\$34.95 15GB 256Kbit/s	\$44.95 25GB 512Kbit/s	\$44.95 25GB 512Kbit/s	\$89.95 35GB 1.5Mbit/s	✓	✓	\$99 6mths	✓
Ispace ADSL	1800 264 246	www.ispace.net.au	\$29.95* 200MB 256Kbit/s	\$49.95 5GB 512Kbit/s	\$69.95 35GB 512Kbit/s	\$89.95 15GB 1.5Mbit/s	✓	✓	\$120 6mths	✓
ITEL ADSL	13 36 36	www.itel.net	\$29.95* 200MB 256Kbit/s	\$45.95* 1GB 512Kbit/s	\$69.95 No limit 512Kbit/s	\$89.95* 10GB 1.5Mbit/s	✓	✓	\$129 12mths	✓
ADSL Broadband	1300 663 484	www.itginternet.net.au	\$31.79* 200MB 256Kbit/s	\$54.89 5GB 512Kbit/s	\$59.90 50GB 512Kbit/s	\$79.90 15GB 1.5Mbit/s	✓	✓	\$95 6mths	✓
JazzyNET ADSL	1300 852 949	www.jazzy.net	N/A	\$46.50 25GB 512Kbit/s	\$46.50 25GB 512Kbit/s	\$88 35GB 1.5Mbit/s	✓	✓	\$110 1mth	✓
Jump Internet ADSL	1300 785 867	http://jumpnet.com.au	\$30* 200MB 256Kbit/s	\$50* 2GB 512Kbit/s	\$80 40GB 512Kbit/s	N/A	✓	✗	\$0 12mths	✓
Koala ADSL	1300 720 109	www.koalatelecom.com.au	\$29.95† 500MB 256Kbit/s	\$39.95† 3GB 512Kbit/s	\$79.95† No limit 512Kbit/s	\$64.95† 10GB 1.5Mbit/s	✓	✓	\$129.95 6mths	✓
Lets Go ADSL	1300 556 114	www.letsgo.com.au	N/A	\$59.95 30GB 512Kbit/s	\$59.95 30GB 512Kbit/s	\$99.95 30GB 1.5Mbit/s	✓	✓	\$99 6mths	✓
Lizzy ADSL	1300 364 074	www.lizzy.com.au	\$18.95* 200MB 256Kbit/s	\$39.95 2GB 512Kbit/s	\$54.95 No limit 512Kbit/s	\$94.95 No limit 1.5Mbit/s	✓	✓	\$99 6mths	✓
Lucidity Communications ADSL	1300 768 146	www.lucidity.net.au	N/A	\$59.95† 25GB 512Kbit/s	\$79.95† 35GB 1.5Mbit/s	\$79.95 35GB 1.5Mbit/s	✓	✓	\$120 1mth	✓
Midcoast Internet DSL	1300 134 638	www.midcoast.com.au	\$28.50* 200MB* 256Kbit/s	N/A	\$71.50* 10GB* 512Kbit/s	\$98* 10GB* 1.5Mbit/s	✓	✓	\$99 6mths	✓
Neighbourhood Cable	1300 366 248	www.ncable.net.au	\$27.95* 200MB 256Kbit/s	N/A	\$69.95 10GB 512Kbit/s	\$99.95 10GB 1.5Mbit/s	✓	✓	\$99 12mths	✓
Netbay Xtreme DSL	1300 733 215	www.netbay.com.au	\$29.95* 500MB 256Kbit/s	\$39.95* 1GB 512Kbit/s	\$49.95* 10GB 512Kbit/s	\$69.95* 10GB 1.5Mbit/s	✓	✓	\$99 12mths	✓
Netspace Home ADSL	13 14 56	www.netspace.net.au	\$29.95* 300MB 256Kbit/s	\$39.95 1GB* 512Kbit/s	\$59.95 25GB* 512Kbit/s	\$79.95 20GB* 1.5Mbit/s	✓	✓	\$99 6mths	✓
Netspace SOHO ADSL	13 14 56	www.netspace.net.au	N/A	\$59.95 15GB 512Kbit/s	\$59.95 15GB 512Kbit/s	\$99.95 20GB 1.5Mbit/s	✓	✓	\$99 6mths	✓
NetSpeed ADSL	13 16 76	www.netspeed.com.au	\$24.95* 200MB 256Kbit/s	\$54.95* 15GB 512Kbit/s	\$74.95* 30GB 512Kbit/s	\$94.95* 30GB 1.5Mbit/s	✓	✓	\$139 6mths	✓
Optraweb ADSL	1300 785 954	www.optraweb.com.au	N/A	\$44.95 5GB 512Kbit/s	\$74.95 60GB 512Kbit/s	\$81.95 15GB 1.5Mbit/s	✓	✓	\$129 6mths	✓
Optraweb Excess ADSL	1300 785 954	www.optraweb.com.au	\$32.95* 2GB 256Kbit/s	\$39.95* 2GB 512Kbit/s	\$74.95* 60GB 512Kbit/s	\$81.95* 15GB 1.5Mbit/s	✓	✓	\$129 6mths	✓
Optraweb Bundle DSL	1300 785 954	www.optraweb.com.au	\$27.95† 2GB 256Kbit/s	\$34.95† 2GB 512Kbit/s	\$69.95† 60GB 512Kbit/s	\$80.95† 15GB 1.5Mbit/s	✓	✓	\$129 6mths	✓
OzForces Residential ADSL	1300 134 081	www.ozforces.com	\$24.95* 200MB 256Kbit/s	N/A	\$68.95 25GB 512Kbit/s	\$89.95 35GB 1.5Mbit/s	✓	✓	\$119 6mths	✓
Pacific Internet DSL	13 36 35	www.pacific.net.au	\$29.95* 250MB 256Kbit/s	\$39.95 1GB 512Kbit/s	\$54.95 No limit 512Kbit/s	\$69.95 10GB 1.5Mbit/s	✓	✓	\$99 6mths	✓
Primus Flexible Broadband	1300 850 000	www.primus.com.au	\$24.95† 500MB 256Kbit/s	\$34.95† 1GB 512Kbit/s	\$69.95† 20GB 1.5Mbit/s	\$59.95† 12GB 1.5Mbit/s	✓	✓	\$118 1mth	✓
Quantum ADSL	1300 884 170	www.quantumtelecom.com.au	N/A	\$49.95† No limit 512Kbit/s	\$49.95† No limit 512Kbit/s	\$79.95† No limit 1.5Mbit/s	✓	✓	\$140 1mth	✓
Quick Internet ADSL	1800 000 355	www.qc.quick.com.au	\$29.99* 200MB 256Kbit/s	\$54.99 5GB 512Kbit/s	\$74.99 No limit 512Kbit/s	\$89.99 10GB 1.5Mbit/s	✓	✓	\$120 6mths	✓
Rabbit Internet ADSL	1800 501 106	http://rabbit.com.au	\$27.95† 200MB 256Kbit/s	\$34.90† 1GB 512Kbit/s	\$57.1* 30GB 512Kbit/s	\$71.41† 10GB 1.5Mbit/s	✓	✓	\$99 6mths	✓
Rapid Net ADSL	1300 724 677	www.rapidnet.com.au	\$34.95 500MB 256Kbit/s	\$44.95 5GB 512Kbit/s	\$49.95 15GB 512Kbit/s	\$79.95 12GB 1.5Mbit/s	✓	✓	\$109 6mths	✓
REEDS.NET Internet Services	1300 734 445	www.reeds.net.au	\$29.95* 300MB 256Kbit/s	\$49 25GB 512Kbit/s	\$49 25GB 512Kbit/s	\$87 35GB 1.5Mbit/s	✓	✓	\$125 6mths	✓
Saco Technology ADSL	1300 664 186	www.sacotech.com.au	N/A	\$45.95† 2GB 512Kbit/s	\$75.95† 60GB 512Kbit/s	\$89.95† 15GB 1.5Mbit/s	✓	✓	\$129.95 6mths	✓
Simplici† ADSL	1300 746 754	www.simpliciti.com.au	\$31 500MB 256Kbit/s	\$47 5GB 512Kbit/s	\$57 30GB 512Kbit/s	\$87 10GB 1.5Mbit/s	✓	✓	\$99 3mths	✓
SnowyNet ADSL	1300 556 315	www.snowy.net.au	\$29.90* 200MB* 256Kbit/s	N/A	\$69.90 No limit 512Kbit/s	\$99.90 No limit 1.5Mbit/s	✓	✓	\$110 6mths	✓
Southern Cross Telco ADSL	1800 727 777	www.sctelco.com.au	\$29.95† 400MB 256Kbit/s	\$39.95† 2GB 512Kbit/s	\$79.95† 30GB 1.5Mbit/s	\$79.95† 30GB 1.5Mbit/s	✓	✓	\$99 6mths	✓
Spin Internet	1300 303 375	www.spin.net.au	\$19.99* 200MB 256Kbit/s	\$39.99* 1GB* 512Kbit/s	\$79.99 No limit 512Kbit/s	\$69.99* 15GB* 1.5Mbit/s	✓	✓	\$99 6mths	✓
Superword SuperDSL	1300 888 090	www.superword.com.au	\$24.95* 500MB 256Kbit/s	\$44.95* 10GB 512Kbit/s	\$59.95 No limit 512Kbit/s	\$89.95* 30GB 1.5Mbit/s	✓	✓	\$110 6mths	✓
TalkTODAY ADSL	1800 486 329	www.talktoday.com.au	\$29.95* 200MB* 256Kbit/s	\$44.95† 1GB* 512Kbit/s	\$69.95† 40GB* 512Kbit/s	\$74.95† 10GB* 1.5Mbit/s	✓	✗	\$119 6mths	✓
TelstraTelia SME & Res	1300 783 528	www.telstratelia.com.au	N/A	\$49.95 25GB 512Kbit/s	\$79.95 35GB 1.5Mbit/s	\$79.95 35GB 1.5Mbit/s	✓	✗	\$120 6mths	✓
Telstra BigPond ADSL	13 12 82	www.bigpond.com	\$29.95* 200MB* 256Kbit/s	N/A	\$69.95† 12GB* 1.5Mbit/s	\$69.95† 12GB* 1.5Mbit/s	✓	✓	\$99 12mths	✓
Fat Free Broadband ADSL	1300 726 831	www.fatfreephones.com	N/A	\$49 25GB 512Kbit/s	\$49 25GB 512Kbit/s	\$89 35GB 1.5Mbit/s	✓	✓	\$110 1mth	✓
TSN Broadband	13 14 86	www.tsinternet.net.au	\$29.95 No limit 256Kbit/s	\$39.95 No limit 512Kbit/s	\$39.95 No limit 512Kbit/s	\$89.95 No limit 1.5Mbit/s	✓	✓	\$129 6mths	✓
Velocity Internet ADSL	1300 557 300	www.velocitynet.com.au	\$29.95* 300MB 256Kbit/s	\$49.50* 4GB 512Kbit/s	\$79.50* 50GB 512Kbit/s	\$89.50* 24GB 1.5Mbit/s	✓	✓	\$69 6mths	✓
VitalTel ADSL Broadband	1300 858 706	www.vitaltel.com.au	\$23.95* 200MB 256Kbit/s	\$48.95 10GB 512Kbit/s	\$48.95 10GB 512Kbit/s	\$68.95 10GB 1.5Mbit/s	✓	✓	\$139.95 6mths	✓
Web Ace ADSL	1800 202 012	www.webace.com.au	\$19.95† 200MB 256Kbit/s	\$39.95† 2GB 512Kbit/s	\$69.95 60GB 512Kbit/s	\$84.95 15GB 1.5Mbit/s	✓	✓	\$119 6mths	✓
Web-Hermits ADSL	1300 785 928	www.web-hermits.com	\$34.95 2GB 256Kbit/s	\$41.95 2GB 512Kbit/s	\$49.95 20GB 512Kbit/s	\$81.95 20GB 1.5Mbit/s	✓	✗	\$109 6mths	✓
Westnet Home ADSL	13 19 60	http://westnet.com.au	\$29.95† 500MB 256Kbit/s	\$34.95† 1GB 512Kbit/s	\$64.95† 25GB* 512Kbit/s	\$69.95† 10GB* 1.5Mbit/s	✓	✗	\$99 6mths	✓
Wild IT DSL + Phone	1800 809 453	www.wilds.com.au	\$31.95† 15GB 256Kbit/s	\$39.95† 25GB 512Kbit/s	\$64.95† No limit 512Kbit/s	\$68.95† 35GB 1.5Mbit/s	✓	✓	\$98 1mth	✓
Wild IT Budget DSL + Phone	1800 809 453	www.wilds.com.au	\$28.95† 5GB 256Kbit/s	\$34.95† 10GB 512Kbit/s	\$64.95† 20GB 1.5Mbit/s	\$64.95† 20GB 1.5Mbit/s	✓	✓	\$138 1mth	✓
Winshop ADSL	1300 137 772	www.winshop.com.au	\$29.95 500MB 256Kbit/s	\$49.95 5GB 512Kbit/s	\$59.95 10GB 512Kbit/s	\$79.95 10GB 1.5Mbit/s	✓	✓	\$139 12mths	✓
Yak Networks ADSL	1300 784 866	www.yak.com.au	N/A	\$54.95 25GB 512Kbit/s	\$54.95 25GB 512Kbit/s	\$87.95 35GB 1.5Mbit/s	✓	✓	\$119 1mth	✓
Yassie Net ADSL	1300 883 352	www.yassie.com.au	\$31.95† 15GB 256Kbit/s	\$38.95† 25GB 512Kbit/s	\$64.95† 100GB 512Kbit/s	\$69.95† 35GB 1.5Mbit/s	✓	✓	\$98 1mth	✓
yourhub ADSL	1300 762 568	www.yourhub.com.au	N/A	\$55 1.5GB 512Kbit/s	\$80 15GB 512Kbit/s	\$95 10GB 1.5Mbit/s	✓	✓	\$110 12mths	✓
ZCTS ADSL	1300 852 949	www.zcts.net	N/A	\$46.50 25GB 512Kbit/s	\$46.50 25GB 512Kbit/s	\$88 35GB 1.5Mbit/s	✓	✓	\$110 1mth	✓

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High definitions

The camcorder primer

We're marching toward a HD future that cuts across our PCs, TVs, projectors and even online video content. *Seamus Byrne* explains why, if you want your own videos to keep up with the times, you'll need to think about your HD options sooner rather than later.



High-definition is a revolution in video — and with any revolution comes a period of anarchy. With HD cameras now well within the consumer price range, it's in your best interests to know what's what in high-definition. Should you go for Sony's AVC HD disc-based camera? Or Canon's HDV camera on miniDV? Both are \$2,299 (at time of writing), but which one is right for you? And what of the new hard drive units? If you want to choose something that will serve you well for many years to come, this is an important choice.

Here's a primer on what you need to know about high-def camcorders and codecs, so you can make up your mind on which camera will be right for you.

HEADY HEIGHTS OF DEFINITION

It seems, like broadband, we're currently looking at a variety of definitions for HD, some "higher" than others. While the weakest notion of HD is 576p (a progressive-scan version of PAL), the main flavours you're going to meet in consumer camcorders are 720p and 1,080i. These numbers represent the horizontal scan lines present in the signal, and whether they are scanned at once (p for progressive) or in two passes (i for interlaced).

If you have to make a choice in this department, it seems 1,080 will become the dominant format in this battle. While there are some debates over whether the progressive scan trumps interlacing, 1,080p formatting will definitely trump anything 720p has to offer, and your 1,080i footage will always look better when there is no reprocessing involved.

The biggest benefit to shooting HD is the addition of much more video detail in your source footage. We'll get into the specific codecs later, but a typical HDV camera is shooting 1,440 x 1,080 compared to a DV source shooting 720 x 576. That's very nearly four times the information. And when you edit for output to a DVD or even a VHS tape, you will lose much of the source information, but when

compared to a standard DV source your final output will still show its higher-class origins. Think of what you expect from a Hollywood film on DVD versus a DVD of your kid's soccer game. Same final output resolution, but different results thanks to the quality of the original source footage.

CAPTURE CODECS

Screen formats are the easy part. Where it really gets messy is in the way cameras encode the footage they capture. High-definition footage can be encoded in a few different ways, with different codecs currently placing different demands on editing systems. The newer or more "professional" the encoding, the more likely you'll need to go with more expensive editing software to get things running.

Here is a list of the main HD codecs you could encounter and a bottom-line explanation of what they should really mean to you.

DV: DV is still the number one video recording format in consumer video and it is close friends with higher-level options like DVCAM and DVCPRO (both are less compressed and are really aimed at the pros, so we won't delve into those here). DV is now ten years old, and was a big step up from its analogue predecessors. It encodes video at 25Mbit/s and carries a total

data stream of about 36Mbit/s — or about 1GB every four minutes. For standard-definition screens, you still get great value out of DV.

An important point is that DV uses intraframe compression. That means every frame is treated as a single image, which makes DV easier to work with in PC editing, as less demand is placed on the CPU when it is decoding footage during playback and render.

HDV: While it seems to share its name with DV, there is no common ground between the formats except for a very similar data rate. HDV is a form of the MPEG-2 standard known in the jargon as MP@H-14 — which means it can encode 1,080i or 720p video. Its similarity of data rate to DV made HDV highly compatible with miniDV tapes. HDV uses an interframe compression method, which makes footage more difficult to work with. Frames after the first are encoded based on changes (when compared to the frames before), so if you cut earlier frames the system needs to calculate a new starting frame. It is sometimes argued that too many edits can really degrade an HDV clip.

AVC HD: The newest of the consumer HD codecs, AVC HD (which stands for Advanced Video Coding HD), is basically another name for the much touted H.264, very well regarded for its scalability and excellent compression ratio. This is a part of the MPEG-4 standard; it was intended to give good results at lower bit rates while also allowing for a range of bit rate options. A rough estimate is the 9Mbit/s AVC HD bit rate gives a similar quality image to HDV, with rates of 12Mbit/s and 15Mbit/s already available in Sony's AVC HD cameras and higher rates available in the codec specifications. Like HDV, it uses interframe compression, but does a better job at maintaining frame accuracy when changes are calculated. However, this even greater compression also makes AVC HD the most demanding on your PC system resources. Both HD-DVD and Blu-ray players will also support AVC HD, as it is part of their software standards (along with MPEG-2

BEYOND 1,080

In the long term, we're going to see even higher definitions arriving. Dubbed 2K and 4K — referring to 2,048 and 4,096 horizontal lines of resolution, respectively — these are currently used for cinema-grade work, but no doubt they'll come along one day to make our current notions of HD seem quaint. The big electronics trade shows are already seeing prototype home theatre screens running these resolutions. My crystal ball says to give it ten years. . .



▲ The compression question: high-definition formats carry much more information than their predecessors.

High definitions



Equip yourself: in addition to formats, consider your mid-to-long-term storage needs.

for DVD support and another format called VC-1, which is based on WMV9).

With these formats there is a distinct line of progression. The better the compression, the more processing power you will need to work with the footage easily on your PC. The two areas where you will see the biggest trouble on older systems will be during real-time effects rendering — it may just fail and demand a render — and during each render you perform.

More important than any of that is ensuring that the software you use offers support for the standard to which your footage has been encoded. While everything works with DV, not everyone is ready for the newer formats. HDV is now supported across the latest versions of Adobe Premiere Elements, Ulead VideoStudio Plus, Pinnacle Studio Plus, Sony Vegas and Apple iMovie, to rattle off the major consumer options.

The story isn't so good for AVC HD just yet. With cameras just now entering the market, it seems there was little pre-planning for software support. Sony has been the first to launch AVC HD cameras and its own Sony Vegas 7 is the only package released to date with support for the new format. At Sony's recent launch event, it stated we will see

software tagged as AVC HD-compatible when the support is included, but no other companies have released or even announced any firm plans to add such support. It could be days, it could be months. Until you know it is coming to your software of choice, it makes it a difficult option to go for at the present time (Vegas users can benefit from the Sony bread buttering right now).



SCREEN FORMATS ARE THE EASY PART: WHERE IT REALLY GETS MESSY IS THE WAY CAMERAS ENCODE FOOTAGE

WORKING WITH HD IN YOUR PC

Back on the general question of working with HD. If you want to work with HD footage on a regular basis, you should consider adding a few key tools to your system.

First up, a screen that has a resolution of 1,920 x 1,080 or higher is a real benefit for previewing your work at native resolution. Right now, this means a screen up around 24in. Many editors do preview their work at lower than full output resolution, so it isn't

mandatory, but if you don't have any other 1,080 line output destination, it is a good investment in seeing your footage at its best.

One very important purchase is a fast, high-capacity external hard drive. You will need a lot of storage space to work with your video, and an external drive (or second internal drive, if you prefer) helps to let your video drive do all its work for the footage alone. With the additional pressures on CPU performance with compressed HD video, it will help your system in general to separate the content drive from the main system disk.

You should also keep the mid-to-long-term storage needs for your video in mind here too, particularly if you're thinking of going with a hard drive-based camera. With such devices comes a lack of any "master tape" to store as a backup. This is a deal-breaker for some, while for most this tape-free convenience outstrips any desire for a permanent master. It may not be a problem most of the time, but there will always come a day when you discover you deleted a clip you later wanted. A good strategy is to set aside some space (or another drive just for archiving) where you store your source footage for a couple of months. (At least this gives you some time to think about any further uses, or should someone else come asking for a clip you hadn't thought you would need.)

Finally, if you want the full HD experience, you're going to have to jump onto the next-generation disc wagon at your earliest convenience. Without it you're looking at HD purely for sharing as data files and playback on computers and projectors. But being so early in yet another format war — Blu-ray versus HD-DVD — you will either have to get both or plant

your own flag in one of the two camps. Getting into the thick of this debate is its own story, but I will give a quick nod to a recent Forrester report that has its analysts seeing a win for Blu-ray (though a bloody battle it will be).

WHICH FORMAT SHOULD YOU CHOOSE?

The short answer is that, right now, HDV is the way to go. The lack of editing support for AVC HD makes it a big problem for most users, and the additional processing power needed may

WHAT'S MPEG ANYWAY?

MPEG stands for the Motion Picture Experts Group, a group within the International Organisation for Standardisation (ISO) with the responsibility of developing our video and audio encoding standards. The group meets quarterly for a week at a time and currently boasts around 350 members from research organisations, universities and industry. Along with MPEG-2 and MPEG-4, they are also responsible for MP3s (aka MPEG-1, layer 3) and continue to develop new standards for multimedia and mobile applications.

And H.264? Well, the AVC standard was co-developed by MPEG with another group, the ITU-T Video Coding Experts Group. That group labels its standards around the H.26x naming convention — which is where that alternate name comes from. It really is the exact same thing!

see some users with older systems struggling to have a good editing experience. If you are happy to spend the extra time doing a few more test renders to see your progress, then AVC HD might be worth the trouble — particularly for Vegas users who can get into things right away.

The long answer? Wait a little longer, then get an AVC HD camera. If you have a system update in the pipeline (or have a relatively new system anyway), then you'll be ready for working with AVC HD in a real-time workflow. There are more AVC HD cameras expected soon from Panasonic in particular (no local announcements, but prototypes have been on display at recent trade shows), so this format is getting ready to take off.

Once support for AVC HD is more widespread, it is likely to take a lead over HDV as the main consumer HD capture format. MPEG-4 is the future of HD, so, short of spending \$10,000 or more on a pro-grade HD camera, AVC HD has a greater flexibility and performance to suit our digital future.

CONSUMER HD REALLY IS HERE

It's amazing that we really do have cheap access to high-definition video production before the widespread arrival of the right screens to watch it on. But the extra resolution is valuable to any video output, with the added value that you are very ready for the HD revolution once things smooth out (and more people can watch your work the way it was meant to be seen). If you only want to upgrade your camera once to suit you for the next five to ten years, the next few months really is a great time to be shopping around. [MORE](#)

Hot consumer HD camcorders

Prices correct at time of writing.



▶ **Sony HC3:** Sony's revised consumer-level HDV handycam does a very good job in a very small package. \$2,299

▶ **Canon HV10:** this is an impressively small HDV unit in the palm-fit form factor. Where many HDV cameras capture 1,440 x 1,080, the HV10 gets a full 1,920 x 1,080 capture. \$2,299



▶ **Sony SR1:** the 30GB hard drive AVC HD camera that also uses Sony's ClearVID CMOS sensor and records at up to 15Mbit/s. \$2,499

▶ **Sony UX1:** DVD-based AVC HD unit, which can shoot standard-definition playable in a DVD player or HD that will play in any Blu-ray player or PS3. Top record bit rate here is 12Mbit/s. \$2,299



On the drawing boards

JVC Everio HD (unannounced): A high-definition update to the ground-breaking Everio hard drive camera range. No ETA as of yet, but a recent appearance at the CEATEC shows intimates that it is definitely on the way. \$TBA

Panasonic AVC HD: Panasonic is a partner in the AVC HD format, and while Sony has been first to launch, Panasonic has been showing off prototypes at CEATEC recently. This can't be too far away, but no local news just yet. \$TBA

Living in a Linux-only universe, part 4

The challenge continues as *Ashton Mills* forgoes the delights of Windows for a world subsisting on Linux. Is it enough, or will he go spare?

ASHTON MILLS

Ashton has been a tech journo for over 12 years, including five years with APC.



THE RATINGS

In this project we're making the assumption that Windows does all that we need — and we're seeing if Linux and open source software measures up. Perhaps that's not an entirely fair place to sit; however, as the de facto in operating systems for which everyone is familiar, it's our best basis for comparison. So here's how we'll rate the experience of going Windows-free:

OPTIMAL

Passes with flying colours. The task could not only be completed, but better or easier than under Windows.



PASS

No problems. The task can be completed exactly as under Windows.



IFFY

When a task could only be partially completed or completed but not without issue.



FLOP

Not possible to complete at all. (Probably not a good thing.)



This month proved interesting: my challenge came not from myself (in my adoption of Ubuntu as my desktop and world), but from my partner, walking up to me with a beaming smile and holding her latest purchase: the double CD *Priscilla Queen Of The Desert, The Musical*. She said, "Can you put this on my iPod?". As a self-confessed non-geek, she's assigned all PC responsibilities to me, and with full confidence in my Linux desktop I said, "Of course!". After all, it was open source that took the Fraunhofer MP3 format and ran with it, providing a range of free MP3 encoders and then further improving the format. So, this would be a snap, right? Well, not quite.

ENCODING PRISCILLA

Despite fixing up MP3, WMV and other media format playback in a previous instalment of the challenge, I quickly discovered that this didn't apply to actually *encoding* as well as decoding. I could play MP3s fine, but I couldn't seem to encode them.



Sound Juicer is Ubuntu's default CD ripper and encoding tool.



Starting up Sound Juicer, the de facto GNOME CD-ripping software, I found that its feature set was missing the ability to actually encode MP3s. Which is somewhat of an oversight, you'd think, being a CD ripper.

Oh, it handles other formats — including ripping to WAV, Flac (a great lossless format) and OGG (lossy, generally superior quality to MP3). And if I was ripping for myself I'd use Ogg anyway, as I've done for most of my collection.

But iPods don't play Oggs — I need MP3s.

To be fair to Sound Juicer, its ability to encode is defined by the underlying Gstreamer media engine in GNOME, so the lack of an option to encode to MP3 actually resides there and not with Sound Juicer, which is just doing what it's told.

The problem is, there was no help within Ubuntu on how to enable MP3 encoding and no automated tool that I could find. Which is crazy, as this has got to be one of the most common tasks to perform under a home operating system. Well, unless you were born last century and still love vinyl — but I digress.

Again the Ubuntu forums came to the rescue and there was a simple, but somewhat convoluted, solution: first, install some Gstreamer libraries for lame (a cross-platform open source high quality MP3 encoder), and then create a new MP3 profile in Sound Juicer to call on the Gstreamer lame support, with the following cryptic Gstreamer pipeline definition:

```
audio/x-raw-int,rate=44100,channels=2 ! lame name=enc
bitrate=160 ! id3v2mux
```

So, not exactly something your average Joe is going to either know — or be able to work out without outside help. Again, as touched on in part two of the challenge, the lack of MP3 support in all its forms is more an issue of proprietary and licensed technology than an oversight, but still it would be a simple thing to add a big fat message stating "Can't rip to MP3? Go [here] to enable it...".

With the new MP3 profile in hand, Sound Juicer worked its magic ripping and encoding, as did filling

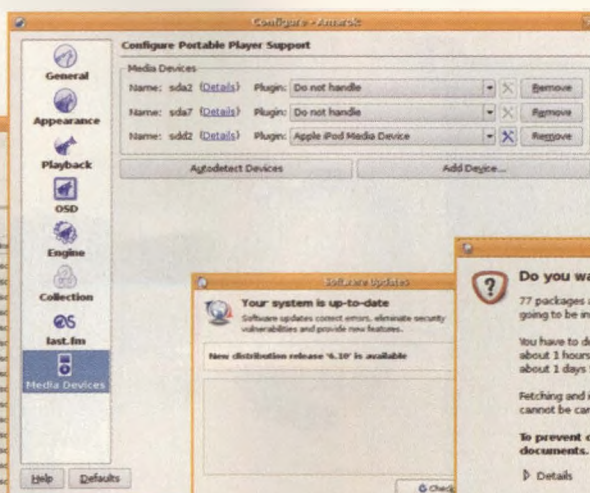


Adding MP3 encoding support to Sound Juicer.

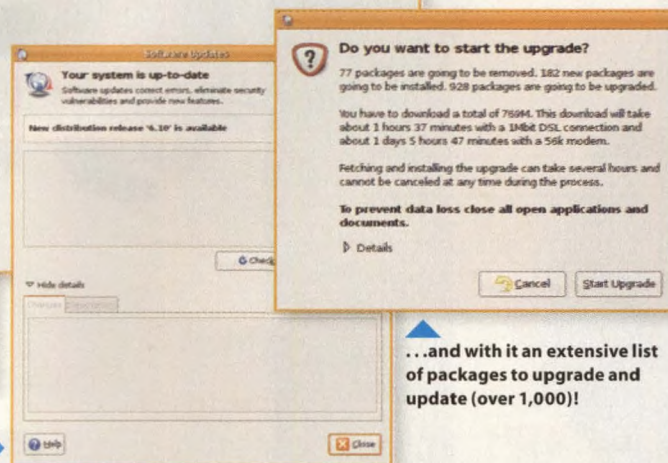


As easy as it gets — plug and play iPod on the desktop.

Rhythmbox found the iPod's collection automatically.



Amarok, more fully featured than Rhythmbox, was used to easily copy songs to and from the iPod.



...and with it an extensive list of packages to upgrade and update (over 1,000)!

in album and song title details from MusicBrainz. I had my MP3s.

INTRODUCING THE IPOD

With MP3s ready to go, the next task was to copy to the iPod. Ironically, I was dreading this more than the encoding, for the last time I tried this under Linux it was anything but easy to get working, if indeed the operating system recognised the device at all.

Not so with my Ubuntu install. In fact, it couldn't have been easier.

After plugging in the iPod nano, an iPod icon appeared on the desktop and Rhythmbox, Ubuntu's default Gnome-based media player, popped up. Underneath the icons for the local collection playlists was an iPod device. It could read and play from the iPod, but I quickly found it didn't appear to enable transferring to it. Not a problem, as Amarok, a rather sleek KDE-based media player and organiser which I had also installed, found the device and, although it couldn't immediately identify it — a pop-up box with options ranging from Creative Nomad, Generic Media Player and of course Apple iPod was presented —

once configured, it happily transferred to and from the iPod with a click of a button (well, two clicks — select the tracks, then Transfer). Much easier than futzing with iTunes and its controlling interface under Windows, and exactly the type of result you expect from your desktop — plug and go.

UPGRADING TO EDGY EFT

Soon after keeping my partner happy in her music, the latest version of Ubuntu 6.10, "Edgy Eft",

was released and with it a host of upgrades and new features. Well, I thought, this is as good a time as any to evaluate the upgrade process!

So, trusting the Ubuntu developers, I took the plunge.

Now, by default, the Update Manager looks for and installs only new or updated packages for the current distribution (in this case my Ubuntu 6.06) and doesn't automatically offer a full upgrade to the new one. This actually makes a lot of sense — you might not want to upgrade, and so you're only going to want to see the packages (new programs, security fixes etc.) that apply to your current version.

Telling Update Manager I do want to perform a full upgrade to the new version is easy enough — the release notes on the Ubuntu home page tell you to launch the Update Manager from the command line (instead of the Ubuntu menu) with: `gksu "update-manager -c"`.

So, that's exactly what I did. The jump from 6.06 to 6.10 sounds small, and it's certainly no leap like going from Windows XP to Windows Vista but, none the less, almost every package in the system needed to be upgraded. The Update Manager reported that 77 packages would need to be removed, 182 new packages installed and 928 packages upgraded. If you weren't aware before that under the hood there are an awful lot of packages installed, you certainly are now! The total download for the new and updated packages would weigh in at 769MB. I'm effectively re-downloading my entire operating system. But would it keep everything — especially my data, my work (oh, and my MP3s) — intact?

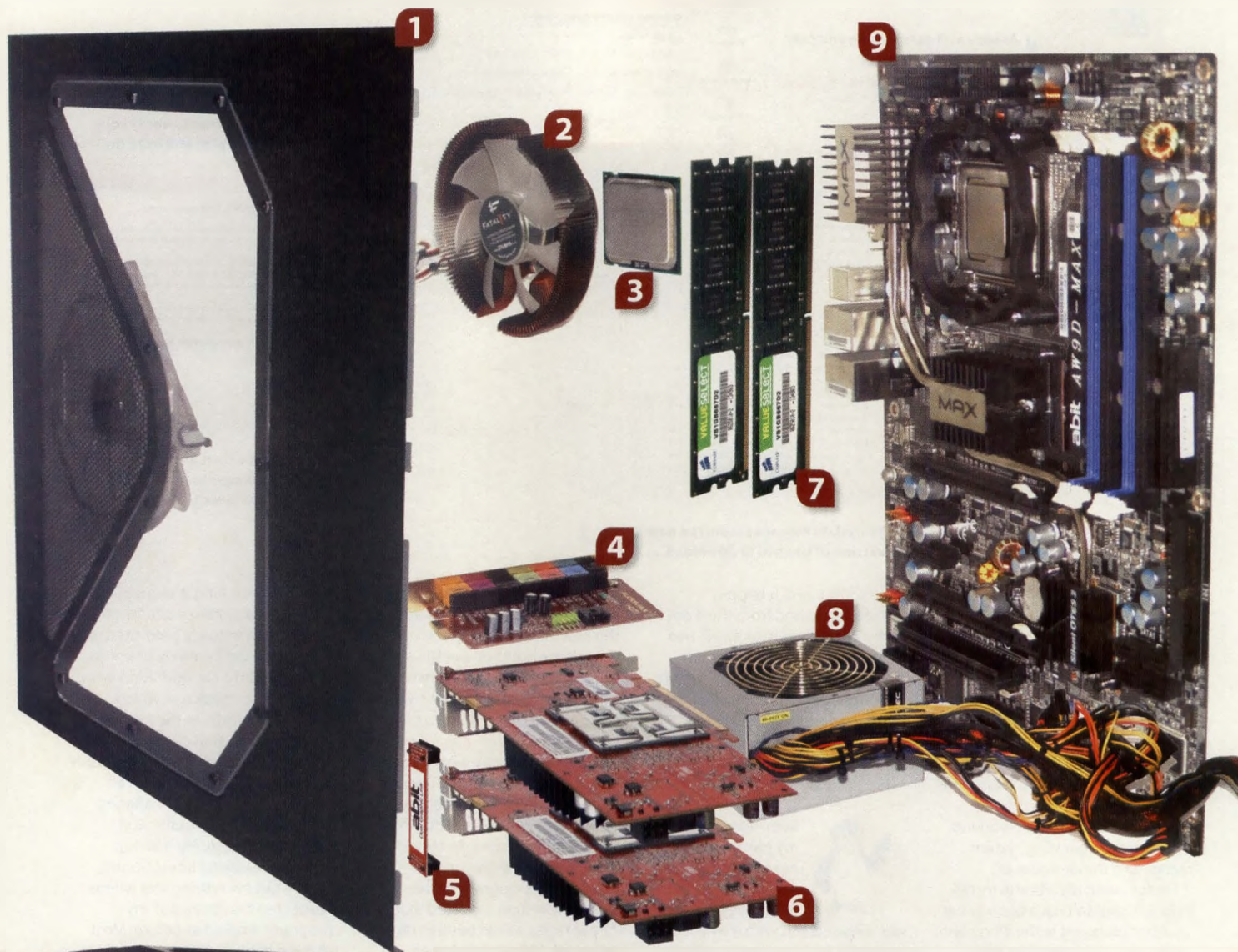
As it happens, yes. After waiting just over half an hour (I'll take a moment now to hug my ADSL modem — what, don't you do this

too?) and watching it sequentially upgrade my system while I'm still using it, it eventually prompted to reboot. It wasn't entirely seamless — it reported a configuration error with a Python package, which ironically came from the Automatik install routines that gave me full media playback capability. But, aside from this, I was greeted with an updated Ubuntu login manager, desktop theme and, ultimately, operating system. My desktop was now using the latest Gnome 2.16 — but everything was where I expected it to be and all my programs worked as before. Most of them had just been given newer version numbers.

As an aside — as it's probably not immediately apparent — upgrading to the new version didn't just upgrade the base operating system, but also all the applications I had since installed on top as well. Think about it for a moment — imagine upgrading Windows and having all your third party applications upgraded at the same time, everything from utilities and browsers to games and office applications. That's what the upgrade system does here, checking all packages, not just those originally installed, and grabbing the latest versions. Fantastic, as I don't need to hunt around for all of these upgrades myself. I even got my hands on the newest version of Sound Juicer! **UTILS**



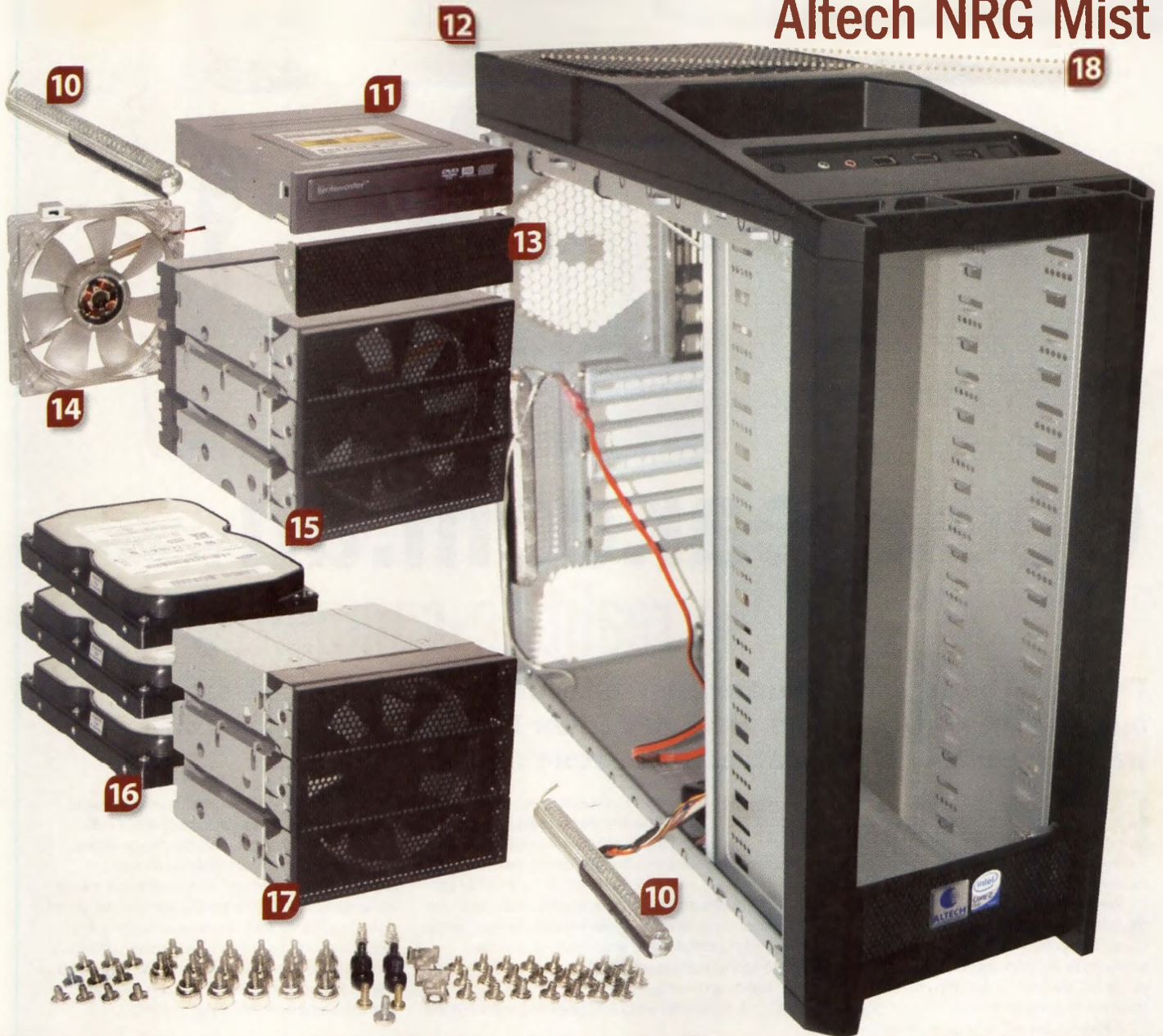
I'LL JUST TAKE A QUICK MOMENT NOW TO HUG MY ADSL MODEM — WHAT, DON'T YOU DO THIS TOO?



Altech's NRG Mist PC beats the heat with multiple fans. We exploded it to see how it keeps its cool...

- 1 Case door** — anodised steel chassis door with Perspex window and fan to cool and view your components.
- 2 FS-C77- Zalman Fatality** — this oversized 120mm CPU fan uses its huge blades to move the same amount of air as a smaller fan, but at half the operating volume.
- 3 CPU** — Core 2 Duo E6300 1.86 GHz Clock Speed, FSB 1066MHz, 2MB L2 Cache, Socket LGA775. Sold overclocked to 2.5GHz.
- 4 Sound card** — AudioMAX HD 7.1 is an add-in surround card with support for jack sensing and S/PDIF in/output.
- 5 SLI bridge** — used as a physical interconnect between two graphics cards in SLI mode, and allows workload balancing for graphics rendering.
- 6 Graphics cards** — two Xpertvision EV-7900GS-D3 cards in an SLI configuration provide advanced graphics performance comparable to more expensive single cards and high gaming frame rates, even at high resolutions.
- 7 DDR2 memory** — Corsair VS2GBKIT667D2 — 2,048MB KIT. The lifeblood of a PC's performance, two 1GB memory DIMMs in dual-channel configuration offer high performance and free up slots for future expansion.
- 8 Power supply** — Antec Tru Power Trio TP3-650. This 650W power supply features three +12V rails, each with a dedicated circuit for power stability and plenty of SATA and Molex connectors to hook up drives.

Altech NRG Mist



9 Motherboard — Abit AW9D MAX. Powered by an Intel i975X chipset, this board supports up to 1066 FSB and dual-channel 800MHz DDR2 memory. CrossFire and SLI ready, it's a proven stable overclocker for enthusiasts.

10 Case lighting — LED lighting and fan controller, this light bar shows off your case and illuminates the hardware inside for viewing through the Perspex window.

11 DVD burner — Samsung WriteMaster SH-W162. A dual-format DVD "plus" and "minus" writer; it also supports dual-layer disc burning for data storage and backup.

12 Case — Antec Nine Hundred. A standard ATX case with a focus on cooling through airflow, it features a top-mounted 200mm exhaust fan, rear 120mm fan and caged 120mm bays for drives.

13 Empty drive bay cover — these need to be removed to add optical drives such as DVD burners and CD-ROMs. Prevents dust

entering the system, but does not inhibit air removal.

14 Fan — 120mm case fan helps remove heat from within the case and prolongs the lifespan of the components in the system.

15 Drive bay — this caged drive bay removes to allow users to install drives; fans mounted within the bay help to cool hard disks and prevent overheating.

16 Hard disk drives — Samsung HD080HJ. Three 80GB 7,200rpm desktop drives provide capacity and speed, ideal for gamers, multimedia creators and DV dabbblers.

17 Drive bay — another removable bay for installation of hard drives, there's plenty of room to expand if you want to add more drives later.

18 200mm case fan — in the top of the chassis, this helps draw hot air away from your system, and works just like the one in your bathroom.



Hot in the city: this case fan provides 200mm of cooling action to keep everything nice and breezy.



Geekgear.com.au

the reality e-commerce site

There is no better way to illustrate how e-commerce works than to create an open-book e-commerce site. Here, APC Editor Tony Sarno will take you on a warts-and-all tour of every aspect of the store's creation.

Enough of writing about e-commerce, we want to do it! We want to sell APC-branded merchandise to the world, to give you an insider's view of how an online store is set up and maybe add a new revenue line to APC's P&L.

We've decided to team up with NetMerchant, the subjects of our e-commerce piece last month. Consultants who provide full e-commerce solutions to small-to-medium businesses, they will guide APC through all the steps necessary to launch and maintain an e-commerce presence.

NetMerchant will help us replicate the experience that any business wanting to launch an online store would go through. The only difference is that we'll be open with absolutely every aspect of the e-commerce operation, including the site's books.

THE PROJECT

We are going to build an e-commerce store called Geek Gear (geekgear.com.au). We'll sell APC-labelled gear ranging from T-shirts to PC gizmos. We'll give you an inside look at the processes of building the store, selecting products, finding suppliers, pricing, selling online and shipping. We'll also cover the issues of dealing with suppliers and customers. Since the main reason for the project is to illustrate how e-commerce works, our financial goal is simply to recover our costs, but if we make more, even better. We're not planning on abandoning magazine and web site publishing.

I visited NetMerchant's offices in Western Sydney for an initial discussion with the managing

director, Luke Amery, on what merchandise APC would sell and what the shop would be named.

I'll cover all the thinking that went into the product selection when we launch the shop in the next issue of APC. But in brief, I felt we needed to sell products that related to APC's brand and took advantage of some of our key skills as wordsmiths and publishers (and would not require the editorial team to moonlight on an assembly line building computers).

T-shirts with witty APC geek slogans fitted the

the business, which would help in marketing it. We liked it even better when we discovered it wasn't taken. After ensuring that the geekgear.com.au domain was available via an internet registry, we checked with IP Australia that it wasn't trademarked. IP Australia is the agency that grants rights in patents, trade marks and designs. A search through its online search system (ATMOSS) showed that Geek Gear was clean. We registered the trademark for \$240. We also secured the domain name from Net Registry for \$55.



GEEK GEAR: WE LIKED THE NAME INSTANTLY BECAUSE IT CLEARLY SPELT OUT THE NATURE OF OUR BUSINESS

bill. They would test our creativity while being easy to source and customise, and unlikely to break on their way to customers, thus avoiding warranty claims. Selling some unusual but interesting technology gizmos would also test our abilities to select products our readers would like. A check of competitors showed some other sites already doing this, which reassured us that people do buy similar gear.

First up we needed to settle on the name of the online business, so we could start talking to the banks. The store's name had to explain at once what was being sold and should fit in with our APC brand. Luke suggested Geek Gear, which we liked instantly because it clearly spelt out the nature of

In addition, we also registered Geek Gear as a trading name, to make sure no-one else could use it as a business name. Luke went to the Department of Fair Trading in Parramatta to register the business name, at a cost of \$137.

Once we had the trading name, trademark and domain name, we could get on with the business of building the store. There are many elements to this, which we'll explore in detail in coming issues of APC. But the very first thing was to set up the necessary merchant bank accounts and a system for receiving payments from our customers.

There are several ways you can receive online payments, but the most serious e-commerce stores will want to process cards, either manually

Geeks and their gear: possible T-shirt and product designs for sale at geekgear.com.au.



through an EFTPOS terminal found in a physical retail shop, or directly, via a payment gateway.

Credit card processing facilities are available from every major bank. While I was thinking about product selection, Luke discussed the payments system with his company's own existing financial institution, the Commonwealth Bank. "Because of the existing relationship, the requirements of business plans and potentially personal guarantees were not necessary to open a merchant facility," he says. You'll find that if you want to open an online credit card processing facility, the banks will ask you for business plans, an insurance so they can claw back funds if customers complain.

The bank offered Geek Gear several POS facilities. Some were retail-based solutions that came with a physical EFTPOS terminal, with names such as EFTPOS PLUS, EFTPOS LITE and XPOS (get more details at: http://business.commbank.com.au/business_display/0,1928,CH2614%255FTS8336,00.html).

Luke says: "It's possible to use these services in an e-commerce environment but it's important to carefully check the merchant agreement for clauses that outlaw the EFTPOS service for e-commerce use. Banks generally frown upon internet transactions processed through retail POS facilities as they believe there is more risk involved, so they often want to charge more."

These services are entirely manual, so we'd have to run the credit card numbers manually through a physical EFTPOS terminal. I've got a magazine to put out, so this was not an option. The next solution the bank supplied us was a Virtual POS. Instead of delivering a physical terminal, the bank gives the merchant a web site that has the same functionality.

Yet another option was CommWeb, a Commonwealth Bank-provided payment gateway that uses the three party model — the same as if a store uses PayPal to process credit cards. With CommWeb, the checkout process on the NetMerchant site shells out to a third party interface that collects the credit card information, does the processing

in real time then returns the result (and the customer) back to the completed step in the checkout process on the NetMerchant server. Luke says: "This model is popular with banks and third party payment gateways and checkouts — mostly because they want their brand in your checkout process. However, we want to present a simple seamless process to our customers: not a patch work quilt of web sites, which is also more fragile."

We decided it would be better for Geek Gear to offer a fully automated credit card payment solution. Here, after opening the merchant account with the bank, we would need to find a

payment gateway: a middle-man financial organisation that provides the link between your checkout and the credit card processing network.

We took a look at NetRegistry's payment gateway, which was made attractive by its flat payment scheme, unusual amongst payment gateway providers. However, the gateway is limited only to the NAB and St George banks, and we wanted to use Commonwealth Bank for our merchant facility. It's possible to use a merchant facility at one bank and have your main account at another, but funds would then be available only after end-of-day transfers.

So as the first chapter in setting up our store ends, we've opted for DirectOne, a SecurePay gateway which works nicely with any bank in Australia that processes credit cards. The cost is \$595 (ex GST) for 2,000 transactions annually and 45c a transaction thereafter. This plan makes sense since we don't know how many transactions our store will use. In the next issue, we'll also discuss how we selected the products we want to sell. **ETC**



THE GEEKGEAR.COM.AU SERIES

- Getting started
- Banking setup and product planning
- Web site development and launch
- Online marketing — search engine optimisation
- Web site design and launch
- Back-end processing — freight, holding stock, payment processing etc.
- How the store did

[home](#)[features](#)[downloads](#)[self-help/FAQs](#)[forums](#)[get Zen Cart™](#)[WIKI docs](#)

ZenCart™
the art of e-commerce

Open source carts

making use of proven systems

There's an open source version of most things, including e-commerce stores. Developer Tim Buchalka discusses the open source approach to e-commerce. Make sure you brush up on your PHP skills.

In order to sell products on the internet, you need e-commerce software. This is the software that allows visitors to your web site to browse and select from your range of products; software that has the functionality to record financial and address information about your customers; and to accept payments from them (of course there is a lot more the software needs to do, but this is a good start).

So what do you do? Find a commercial off-the-shelf package and hope it will do everything you need it to do? Or do you teach yourself programming (or hire a programmer) to develop a site that is exactly designed to what you need?

There is another option. Using tried-and-tested open source software and modifying parts of it to suit your site's specific needs.

The two open source e-commerce packages I will discuss below probably contain around 80-90% of the functions needed by online shops and have the benefit of being used by hundreds if not thousands of shopping sites all over the world. They have been tested in a huge range of scenarios by others, and most of the serious exploits and bugs have been ironed out.

Using open source software gives you the ability to modify the program source code, so you can extend or modify the package to suit your particular needs. This really combines the best of both worlds, as you start off with a ready-made package that contains most of the functions you require, but still gives you the flexibility to customise the product to suit your specific needs.

There are many choices out there, but here I have focused on two of the most popular open source e-commerce packages, osCommerce and Zen Cart.

osCommerce — www.oscommerce.com

osCommerce is an open source-based e-commerce solution that is available for free under the GNU (General Public License).

It features a rich set of out-of-the-box online shopping cart functionality that allows store owners to set up, run, and maintain their online stores with minimum effort and with no costs, fees or limitations involved.

Zen Cart — www.zencart.com

Zen Cart's marketing claims that Zen Cart truly is the state of the art of e-commerce: a free, user-friendly, open source shopping cart system. Zen Cart includes all the necessary tools to build an online store.

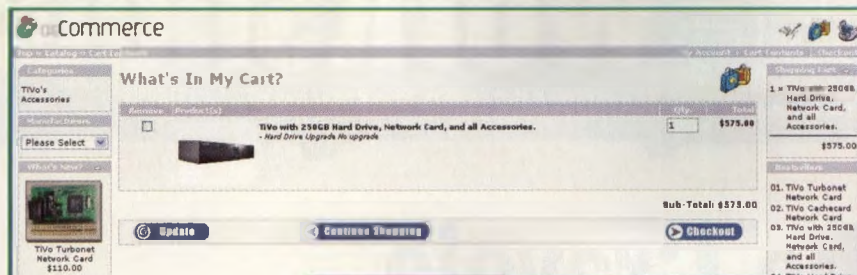
I've used both packages, and can report that they are both very flexible and powerful systems — containing most of the functionality that you will need to run an online store. However, you will still need some customisation to get either package to work properly for our Australian conditions.

WHAT CHANGES NEED TO BE MADE?

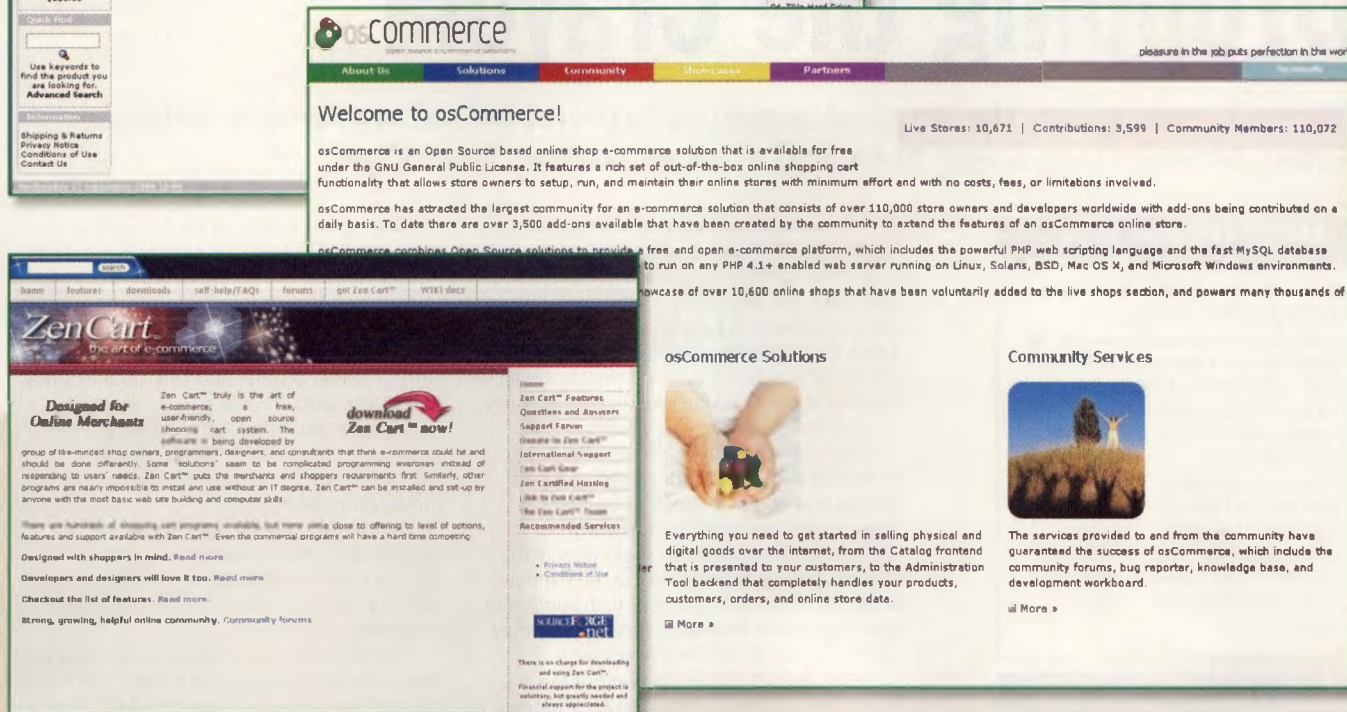
Generally speaking, most of the open source e-commerce packages I have used are not geared towards Australian conditions/buyers. Some don't handle GST correctly (or at all), others use American terminology (eg. "check" instead of "cheque") and some don't offer features that Australian buyers would expect, such as paying for their purchases via BPay.

However, both osCommerce and Zen Cart packages have extensive options to let you customise the e-commerce stores they create: from the name to specific options such as whether products displayed on a web page should show quantities of the stock; whether users have to register (supply their personal information) before purchasing products, and more. They give you a flexible way to add products to the system and assign them by categories, and to optionally allow customers to leave reviews on products.

The configuration is done from a password-protected administration web page, making it



osCommerce and ZenCart are two of the most popular open source e-commerce packages.



very easy for non-programmers to set up the basic details of their shop and to enter products.

The areas you will most likely need to customise are things like GST handling, freight/shipping costs, changing the terminology to suit Australian users and changing the store's accepted payment types.

So, if you are confident of your programming skills, this is a good reason to consider open source e-commerce solutions (or open source software in general). If something does not work exactly the way you want it to, then go in there and make some changes to the code so it does work. Try doing that with a commercial, off-the-shelf package. Most, if not all, commercial offerings don't include the source code, so you'll instead be forced to change the way you work to fit what the package allows you to do.

IS IT EASY TO MAKE CHANGES?

Depending on the type of change, it can range from very easy to very hard. If you have some basic programming knowledge, say across PHP, HTML and Javascript, you would probably be able to make the kinds of changes I have mentioned without too much trouble.

If you're not familiar with programming or you don't want to get involved with it, it would be a simple case of finding a programmer and getting his or her to make the changes on your behalf.

WHERE CAN I GET HELP?

Both packages have excellent online forums. These are meeting places for users, where you can discuss problems, find solutions and ask for help. You get to speak to others running online shops. Some have been in the game for a long time and have probably had issues similar to the ones you might have, before having fixed them and moved on. Speaking with them can be an invaluable experience for you in moving your online store forward. There are also programmers on the forums who can offer their services.



USING OPEN SOURCE SOFTWARE GIVES YOU THE ABILITY TO MODIFY THE CODE AND PACKAGE TO SUIT YOUR NEEDS

There are also a large number of add-on open source modules that have been developed for the benefit of others. A functionality you might be looking for may already have been developed by someone else. All you need to do is download and install the relevant module.

One example of this is BPay. osCommerce and Zen Cart don't list this as a default payment method, but another Australian user has contributed a module to handle this, making it an easy thing to add to your web site.

Another user has contributed a module that will look up the cost of shipping via Australia Post based on the dimensions and weight of a parcel. This is very useful stuff and is available for free.

SUMMARY

The use of open source e-commerce software is a good choice when considering options for your online shopping site if you're prepared to roll up your sleeves and get involved in some programming. The best packages to consider are those with a thriving community and which

are being updated and enhanced on a regular basis. Both packages I've mentioned in this article fit the bill in this regard.

It's important that you allow adequate time to test and set up your online site and, in particular, to customise the store to suit your target market. I'm confident that the combination of the right open source e-commerce software with your input and customisations will give you huge advantages over your competitors. **ETC**



Dropping the Crayola

After all these years, the original Windows Explorer is looking homely indeed. *James Bannan* finds a way to replace it — and retires XP in style.

JAMES BANNAN

James Bannan moved to Australia from England in 1982, but remains a stubborn Yorkshireman to the core. He graduated from Melbourne University with a BA/BCom in 1999 and went straight into IT. James worked as a support consultant at Pricewaterhouse Coopers for over three years before moving to St Leonard's College as a systems manager. Outside of work, James is a competitive ballroom dancer.



SKILL LEVEL

● Beginner

TIME TO COMPLETE

● One hour

REQUIREMENTS

● Computer running Windows XP SP2

INSIDE INFO

- bbLean home page <http://bb4win.sourceforge.net/bblean>
- Customize.org www.customize.org/lst/bb4win
- deviantART.com <http://browse.deviantart.com/customization/>
- Desktop plug-ins <http://bb4win.sourceforge.net/bblean/bbsr.htm>
- Other plug-ins <http://xoblite.net/plug-ins.html>
- Online colour picker www.colortools.net/

bbLean uses a simple back-end file structure. ➤

Windows XP was released in October 2001, and, in eye-candy years, that's an awfully long time ago. Now Windows Vista looms large on the horizon, promising updated visuals and features to make the desktop experience new again. But even without Vista you can still get a change of scene. The standard shell in XP can be skinned, altered or done away with completely — all without harming your system.

Behind its complexity, Windows Explorer is simply a UI for the Windows kernel. It gets loaded at startup and provides a graphical representation of the OS' underlying functionality. Replacement shells work in the same way. They provide a GUI to the Windows kernel, although the quality of such applications does depend on how much functionality they expose (and how well they're written).

In this Workshop we'll look at bbLean. It's one of the branches of Blackbox for Windows, which is a shell replacement based on LiteStep. Blackbox for Windows is designed to resemble its namesake for X Windows. In contrast to XP's standard shell, bbLean offers a stripped-back, minimalist look, but still has plenty of features to keep you happy. Have fun, and proceed at your own risk!

GETTING TO GRIPS

bbLean is a very small application — nice and easy to work with. The first step is to get it onto your computer. Navigate to <http://bb4win.sourceforge.net/bblean> and use the download link on the front page. The latest version at the time of writing was 1.16, so the filename was bbLean_116.zip. This file is only 140KB in size.

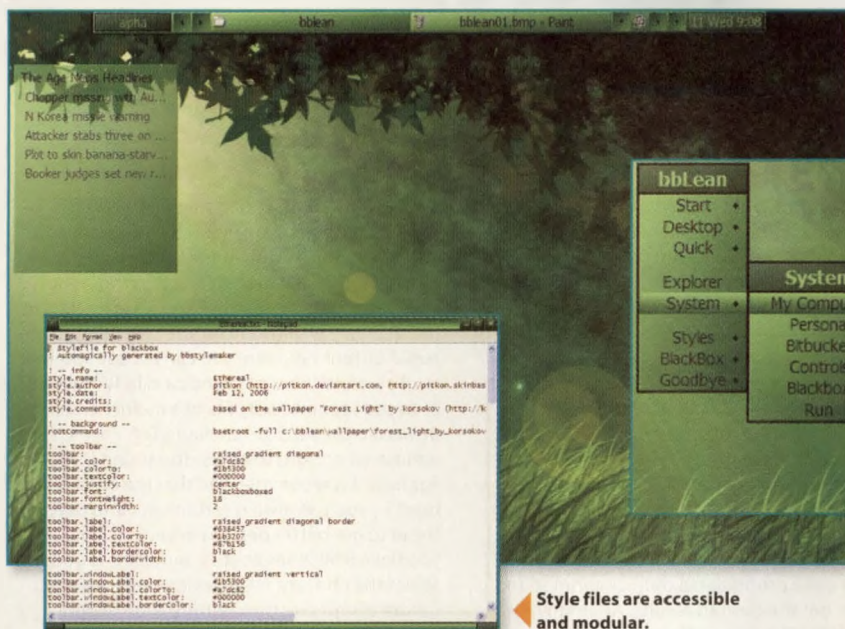
Next, create a folder in the root of your C: drive called bblean (you can capitalise the L if you wish) and extract the bbLean archive to this location, keeping the folder structure intact. Navigate to C:\bblean and you should see the application launcher, blackbox.exe, along with a number of other files and subdirectories for backgrounds, fonts and so on. In the DOCS folder you'll find some quickstart documentation about getting to grips with bbLean, as well as a comprehensive list of hotkeys and shortcuts.

At this point, bbLean is ready to use. Double-click on blackbox.exe and the default bbLean theme will be loaded. Although it looks a bit like a basic Windows theme, there are some important differences.

Firstly, where's the Start button? In bbLean, simply right-click on the clock in the system bar, or anywhere on a blank area of desktop, and the Start menu appears. Everything is accessible through flyout menus — programs, desktop files, the quick-launch toolbar, control panels and every physical or mapped drive your computer can see. You can access pretty much everything from this one menu.

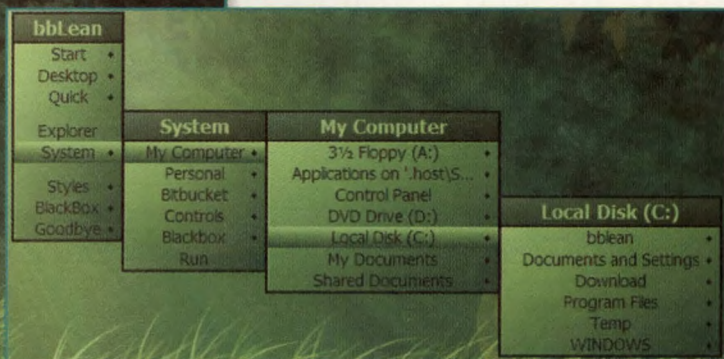
Also, like many shells based on X Windows, bbLean supports multiple desktops or workspaces. Click on "alpha" on the left of the system bar and you can scroll through the other available desktops. Alternatively, hold down Shift and right-click, and get the workspaces menu. This lets you jump around to different desktops and windows, or call windows from other workspaces to the current one.

backgrounds	File Folder
docs	File Folder
fonts	File Folder
plugins	File Folder
styles	File Folder
wallpaper	File Folder
blackbox.exe	113 KB Application
blackbox.rc	2 KB RC File
bsetbg.exe	13 KB Application
bsetroot.exe	255 KB Application
bsetroot.rc	1 KB RC File
changes.txt	4 KB Text Document
extensions.rc	4 KB RC File



And voila! A complete desktop overhaul.

Access anything from the bbLean menu.



Style files are accessible and modular.

Although it's now active, bbLean isn't the default shell on your system yet. If you want it to be, open up the right-click menu, go to BlackBox > Install, and click Install.

BBLEAN THEMES

You can create your own bbLean themes, but there's a large online community that is more than happy to share their efforts. A couple of good sites for bbLean themes are **Customize.org** and **deviantART.com**.

Any bbLean theme you download will have a number of different components, but the one common to all of them is the style file. This is very much what Cascading Style Sheets is to web pages — a guide for the rendering application (in this case, the bbLean application), telling it what to present to the user — and how. Extract this file (it could be a STYLE or TXT file) to the C:\bbLean\styles folder, along with any other files, like backgrounds, to the relevant directories. Then right-click to access the bbLean menu, and the new theme should be visible under Styles.

You'll notice that the theme will become active, but the background doesn't appear. bbLean uses plug-ins called bsetroot and bsetbg to display backgrounds. These are available to download from the bbLean web site.

To use bsetroot and bsetbg, obtain the files online and extract them to C:\bbLean. When installing a theme, its style file should contain a reference to the background image it wants to use. Most use **bsetbg -f** and a contextual reference to the picture file. The best way to go is to change this command to **bsetroot -full** and change the file location from contextual to full (ie. c:\bbLean\backgrounds\picture.jpg). That way, you can make no mistakes and it all works.



THE MODULAR NATURE OF BBLEAN MEANS THAT YOU CAN INSTALL NUMEROUS THIRD-PARTY PLUG-INS

If there's something about the style that you don't particularly like — say, a font colour, for example — you can change it pretty easily. Just open the style file with Notepad and find the feature that you want to change. Most style files are laid out sequentially (if they've been well written), so it's pretty easy to follow. All the colours are written in hexadecimal numbers expressing their RGB value. Black, for example, is RGB = 0,0,0 and its hex value is #000000. White is RGB = 255,255,255 and its hex value is #FFFFFF.

PLUGGING INTO THE COOL STUFF

The modular nature of bbLean means that you can install numerous third-party plug-ins, each adding to its functionality. The plug-ins link on the bbLean web page will actually direct you to the xoblite web site — xoblite is another Blackbox for Windows-based application, which shares the exact same plug-in architecture.

Unfortunately, the plug-in listings provided are bare and only link to the relevant ZIP file — they're not descriptive in any way. However, some of the names do give a clue as to what they offer: BBRssReader brings RSS news items straight to the desktop. However, the majority of the actual downloads have readme files contained within the ZIP file, which will tell you what the plug-in does and how to operate it.

Download and extract any plug-in you wish to install to the C:\bbLean\plug-ins folder. The main application file for each plug-in is a DLL

file. To install, right-click the desktop to get the bbLean menu then go to Blackbox > Configuration > Plug-ins > Add Plug-in. Select the plug-in's DLL and that's it!

There are quite a few plug-ins available, and you'll find more online, but here are some of the best (and newest) that we've discovered:

- BBRssReader 0.0.1 — This is one of the most unobtrusive RSS readers we've seen. It tucks away nicely into the background, but not so much that you can't get the information quickly and easily. You'd be hard-pressed to find a better third-party reader.

- BBMemo 0.0.5 — Onscreen memos can be really useful and, like the RSS reader, BBMemo integrates beautifully into the bbLean workspace.
- BBwintrans 0.7b — Why should you wait for Vista to have cool graphics effects? BBwintrans can be configured to make pretty much any windows nicely transparent. You can also exclude certain apps which don't work as well with transparency, like Photoshop or PowerDVD.
- BBInterface 0.9.9 — For the ultimate desktop tweaker, BBInterface lets you create frames, buttons and controls, all plugged into specific modules. For example, you could create custom sliders to change the volume, bass and treble levels of your sound card, or automatically read your mail. Be warned though — this is a tough plug-in to get working, but the sky's the limit. [BTL](#)

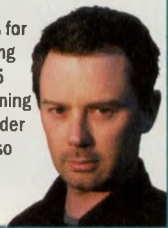


MP3 mixing: DJ-style

Back up your entire record collection to MP3 and you can mix and match your beats without turntables. *Daniel Winter* explains how.

DANIEL WINTER

Daniel Winter is a freelance developer with a background in multimedia and audiovisual production. He has been developing interactive database applications for a decade and producing music and video for 15 years. With award-winning online applications under his belt, Daniel has also been writing for APC since 1999.



SKILL LEVEL

- Beginner to intermediate

TIME TO COMPLETE

- Varies

REQUIREMENTS

- An installed copy of DSS DJ 5.5 (download the free trial version at www.myxoft.com/).

INSIDE INFO

- DirectX plug-ins
www.kvraudio.com/get.php?mode=results&st=q&s=9
- Traktor
www.native-instruments.com/
- MixSense
www.kramware.com/mixsense/
- MR1200
www.mono211.com/monoraveik/mr1200.html
- Decks
<http://decks.50megs.com/>
- Freeverb plug-in
www.users.bigpond.com/prodigalson/Sounds/freeverb/freeverbx.zip
- BlueLine plug-in pack
www.digilogue.de/english/blueline2.exe

Winamp, iTunes and Windows Media Player can play back hours (even days) of music unattended. They can even crossfade each song as they go, but they can't scratch and mix like a DJ. For that you're going to need a multichannel sound card, a pair of headphones and a piece of specialised DJ software.

INSTALLATION AND CONFIGURATION

One of the main problems faced by computer-based DJ applications is trying to monitor with headphones while music is being sent to the speakers. This requires two separate audio streams that are constantly in sync.

Until recently, most applications required you to use a professional multichannel sound card to get the desired results. Alternatively, a cheaper alternative offered by some programs was the option to split the left and right channels of a single stereo sound device. While this would allow you to listen to one track in headphones while playing another in speakers, both would be mixed down to mono in the process.

Fortunately, with the growth in PC DVD players, most motherboards are now fitted with 5.1 compatible sound cards. With the right drivers, four of these channels can be hijacked by a DJ application to allow playback of two separate but synchronised stereo streams. Now, you don't need a pro sound card to be an MP3 DJ, but you do need some decent software. DSS is a commercial DJ app that retails for about \$77, but gives you 30 minutes of unrestricted use at a time for free. This means you can close and reopen the program every 30 minutes if you don't want to buy it — and the demo has no limitations or trial period.

TIP: If you don't have a multichannel sound card, DSS offers the option to split a single stereo output into a mono output for the speakers and another for the headphones.

If your PC has a 5.1 compatible sound card with multiple output connectors, make sure the primary/front line output (usually coloured green) is configured for a set of speakers and the secondary/rear output for a set of headphones. ❶ Connect both and run the sound card configuration application (if you have one).

After installing DSS (download available at: www.myxoft.com/), run the program and click the menu button in the centre of the main window. From the menu, select Configuration and ensure that all the checkboxes are ticked in the general settings tab before switching to the audio output tab. Here you can choose whether to use a multichannel sound card in WDM mode, or to use separate outputs of a multichannel device. In the section labelled STEP 2 there are additional options to adjust the sound buffers. For now it is recommended that the defaults are used — you can always return later and tweak these to get better performance. ❷ Finally, if you have a MIDI keyboard connected to your PC, select the relevant MIDI device in the MIDI tab before dismissing the configuration window with the OK button.

GETTING TO KNOW THE INTERFACE

The top section of the DSS window stores a database of media files. Folders and files can be added to the database using the buttons beneath the file list, and files can be deleted with the delete and clear buttons. A history of all the tracks played is also stored in the left-hand pane, along with any file lists that are manually created. This is a good way of organising tracks by genre or tempo. Additionally, DSS will read the ID3 tags of each media file to retrieve information such as the genre and album title. These can assist when building playlists, which in DSS are more like Windows Explorer folders than the kind of playlists found in media players like Winamp. There is also a search box under the album column of the file list, and tracks can be previewed directly from the file browser using the preview button under the genre column. There is a slider next to the preview button that can be used to preview different parts of the selected track.

PLAYING AND CUEING TRACKS

Once a few folders and/or files are loaded into the browser, these can be dragged and dropped onto either of the two playback units — labelled Deck A and Deck B. After dropping a track onto Deck A, it can be played using the play-pause button. The first thing you will notice are the white vertical lines that appear in the waveform



CUE POINTS ARE SAVED WITH EACH FILE AND ARE A GOOD WAY TO BOOKMARK IMPORTANT EVENTS IN A PIECE OF MUSIC



Ensure that your sound card is configured to connect to speakers and headphones using the front and rear outputs.

display. These are the detected locations of the musical beats which are used to determine the BPM or tempo of the track. DSS has no BPM tap control as found in other DJ applications; instead, it relies completely on automatic beat detection.

If at this point you are hearing dropouts or crackling in the audio, it may be necessary to return to the configuration window and increase the number of buffers and/or the buffer size. Returning to the main window, the first DJ technique you might want to try out is the loop function. This works much like the sampler function used in professional DJ rigs. Clicking one of the buttons labelled $\frac{1}{2}$, 1, 2, 4, 8 or 16 will loop the track at the current location for that number of beats. At this point you will instantly know whether the beat detection is accurate or not (some tracks are harder to mix than others). For instance, mixing four-on-the-floor dance music is always going to be easier than, say, drum 'n' bass. Automatic beat detection will sometimes fail dismally on music without a regular kick drum (or music which is faster than 120BPM). If the beat detection is wrong, try clicking the button marked "< 120BPM" once or twice, but even this may not help. That being said, it isn't always necessary to rely on beat detection to mix tracks together — DJs have been doing it with vinyl for many years, but unfortunately it does require a bit of practice.

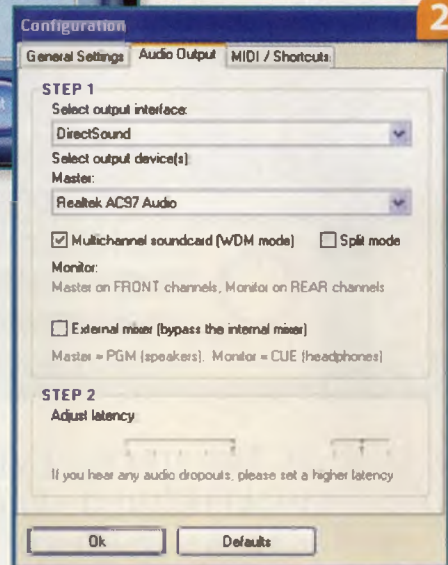
The next thing to do is to set any cue points for the current track. There are eight cue points that can be stored for each song: the first and last indicating the beginning and end of the track. The other six can be set manually by first selecting the desired cue point box (above the loop buttons in each deck) and then pausing the music. A cue point can be reset simply by pausing the song again while a cue point box is selected. Cue points are saved with each file and are a good way to bookmark things like breakdowns, key changes and other important events in a piece of music. The cue-play button will instantly resume playback of a song from the selected cue point, and the cue button will pause the track at the selected cue point, ready to go.

MIXING TRACKS

Now it's time to cue up another track in Deck B. Drag and drop another file onto the deck and then take a quick look at the mixer panel located between the two decks. There is a crossfader slider that is used to mix between the output of the two decks, as well as individual level and gain controls for each.

Beneath the crossfader are cue buttons, which are used to send the output of the selected deck to the headphones independently of the crossfader. This lets you line up a mix without the audience listening in on the process.

DSS will automatically use 5.1 compatible sound cards in multichannel mode.

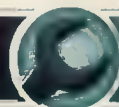


Above the cue buttons are mute buttons marked X and level-boost buttons marked with an arrow. These affect the speaker output, not the headphones.

TIP: You can mute the output of a deck momentarily if needed by right-clicking on the waveform display.

Before playing the second track, slide the crossfader all the way over to the left to ensure that only Deck A is being sent to the speakers. This should automatically enable the cue light for Deck B, which, when played, will now be heard in the headphones. DSS will attempt to sync the two decks together if you click the A<B button. If this fails, you will need to do it manually. Here's how:

1. Slide the pitch control up and down to get the tempos more or less the same.



Moving the crossfader all the way to one side will automatically enable headphone monitoring of the other deck.

want to add reverb, compression or special effects to a track. For instance, a vocal remover DirectX plug-in and the use of cue points can be combined to create an entire remix in real time.

AUTOMATED MIXING

If the decks ever need to be left unattended, the Auto-DJ function can be used to take over the job. The button for this is located in the menu bar beneath the playlist. Next to it is a random selection toggle switch and a field where the number of seconds to crossfade between songs can be specified. This will automatically crossfade between songs in the current playlist and, if it is enabled in the configuration, will attempt to beat-match them in the process. It is even possible to password-protect the program while you're gone, to prevent prying hands from ruining your set. Plus, the entire session can be streamed to a WAV file for later by clicking the REC button in the top-left corner of the window.

IF THE DECKS EVER NEED TO BE LEFT UNATTENDED, THE AUTO-DJ FUNCTION CAN BE USED TO TAKE OVER THE JOB

2. Use the bend +/- buttons to momentarily adjust the playback speed.
3. Left-click inside the waveform display to momentarily pause playback. This helps align the beats when the tempos are more or less the same.

If you're having difficulty lining the two tracks up, there are a couple of additional things that may assist:

1. Try dropping the low and/or mid-range out of the CUE track using the KILL buttons beneath the waveform display. This can help to separate the frequency ranges for the two pieces of music.
2. Use the CUE/PGM slider to mix the amount of each deck being played back in the headphones. Sometimes it is easier to mix to

sources inside the headphones than one outside (in the speakers) and one inside.

DJ TRICKS

DSS can be used to simulate a couple of vinyl techniques, notably the scratch. Dragging inside the waveform display lets you scratch a track in a manner similar to using a turntable. Likewise, there are reverse and brake buttons beneath the waveform panel that simulate other tricks usually performed on turntables. The KILL switches mentioned earlier are also excellent when mixing two tracks together. For instance, they can be used to isolate the bassline from one song so that it can be mixed with the rhythm section of another. If that isn't enough, DSS also supports the use of up to four DirectX plug-ins in each deck. These can be loaded and turned on and off as necessary. This is great if you ever

Booting from your iPod

Anthony Caruana shows you how an iPod can become a handy tool for restoring a dead system.

ANTHONY CARUANA

Anthony Caruana is an IT professional and long-time PDA user whose personal stash of devices is almost a perfect timeline of their evolution. Anthony, who ran the Melbourne Pocket PC User Group for two years, is also involved in the deployment and use of PDAs in corporate environments. Aside from keeping his life organised, Anthony uses handhelds for gaming, playing music and podcasts, and watching movies on-the-go.



SKILL LEVEL

- Intermediate

TIME TO COMPLETE

- Up to three hours (depending on OS)

REQUIREMENTS

- iPod; computer that can boot from a USB device; for Mac — iPod with FireWire; BartPE bootable CD/DVD.

INSIDE INFO

- BartPE bootable disk www.nu2.nu/download.php?sFile=pebuilder3110a.exe

The iPod might be an iconic music player, but it can be so much more. Remember, it's a storage device that can be used for carrying data. While it's handy for on-the-road backups of critical data, you can also use it as a bootable drive for when disaster really strikes.

If you plan to try this with a hard-disk-based iPod then we offer a word of warning — the iPod's hard drive wasn't designed for the day-in/day-out thrashing of running an OS. It's OK for an emergency but not for everyday use as your main system.

Connect the iPod to your PC and fire up iTunes. Go to the Edit menu, select Preferences, open the iPod tab and check the "Enable disk use" checkbox. From this point the iPod will appear as a removable disk in Explorer (or Finder if you're trying this on a Mac). You can enable disk access with an iPod that's loaded with music without any danger that it'll wipe your tunes.

If your PC can boot from USB devices, plug it in, pop the Windows CD into its drive and boot from CD. Follow the usual installation prompts, but choose the iPod when you get to the point where you're asked for the installation location. It's likely that the installation will be slower than if you were installing to a fixed disk (so be patient).

Another way for getting value from the spare storage on your iPod is to boot your system from a BartPE boot disk. BartPE is a bootable CD that allows you to get into your system when the OS won't allow you to boot. As it ships with network support, you can use it to recover data from a dead OS and copy it to another machine on your LAN. This disk will also allow you to take an image, using Symantec Ghost, of your system. You can store that image on the iPod. Boot your system with the Bart PE CD and your iPod connected. Open the Go menu and under Programs launch Symantec Ghost. You can use this menu to either create an image or restore one you've stored on the iPod. Then, if your system happens to get trashed, you can restore the image back to your hard drive.

Once you've installed your OS, updated it with the latest

security patches and set up all your apps and utilities, boot with BartPE and take an image of your system.

Experimenters can use BartPE and their iPods to store images for a bunch of different operating systems and then use the Restore function to load the image they feel like using. We use it for quickly switching between different Linux distros and Windows.

Mac users with a Firewire-equipped iPod can create an alternate boot drive. Macs won't boot from USB devices, so this won't work with the newest iPods. Connect the iPod, launch Disk Utility and go to the Erase section. Set the Volume Format to "Mac OS Extended (Journaled)" and give the volume a name.

Press the Erase button, confirm your decision and the iPod's hard drive will be prepared for the next stage in this operation.

Pop the CD/DVD with your operating system into your optical drive and start the installation process. You'll probably need to reboot the computer — so make sure you've shut everything down and saved all your work before you get started.

When the installation starts, follow the prompts — but when you're asked to choose the installation volume, make sure you select the iPod — you'll be able to identify it easily from the name you gave it earlier.

To switch between iPod-booting and your normal hard disk, go to Preferences and choose the system from which you want to start. **BTC**

iPod booty: set sail for OS backups with your portable music player.





DIY media PC software

Last month, *Stephen Withers* finished assembling the hardware for our media PC — now it's time for the software.

STEPHEN WITHERS

Stephen Withers has been writing for APC since its second issue. With a professional background in operations research and IT, he switched to full-time writing and editing in 1990. As much as he enjoys cutting code, he now has insufficient time for anything more complex than scripting. Stephen has been networking computers since the time when an Ethernet card cost more than a PC.



SKILL LEVEL

Intermediate

TIME TO COMPLETE

One to two hours

REQUIREMENTS

- PC with TV tuner and SoundGraph VFD display; software provided with hardware items; optional software such as MediaPortal.

IN THIS SERIES

- Part 1 – December '06**
Assembling the hardware
- Part 2 – January '07**
Installing the software
- Part 3 – February '07**
Connecting to home entertainment equipment

The public beta of Windows Vista includes Media Center (and appeared just as we reached this stage of the project), so it was the obvious choice. Windows Update installed a Vista driver for the Pinnacle 310i tuner card, but we couldn't get it to work.

Plan B was to use Pinnacle MediaCenter instead, but that didn't work under Vista either. According to distributor Lako Pacific, Pinnacle is working on its own Vista driver for the tuner.

This is an important thing to note — despite the potential of Vista as a media centre platform, it will most likely lack the driver support needed to get older hardware working.

WINDOWS XP

So, we downgraded to Windows XP, installed the drivers and supporting software for the various pieces of hardware — and were in business.

The case we selected was a Thermaltake Mozart with the Media Lab option, comprising an infra-red remote control with the receiver built into the case, a front-panel VFD (vacuum fluorescent display) and supporting software. An especially useful feature is that the remote control can be used to start or shut down the PC.

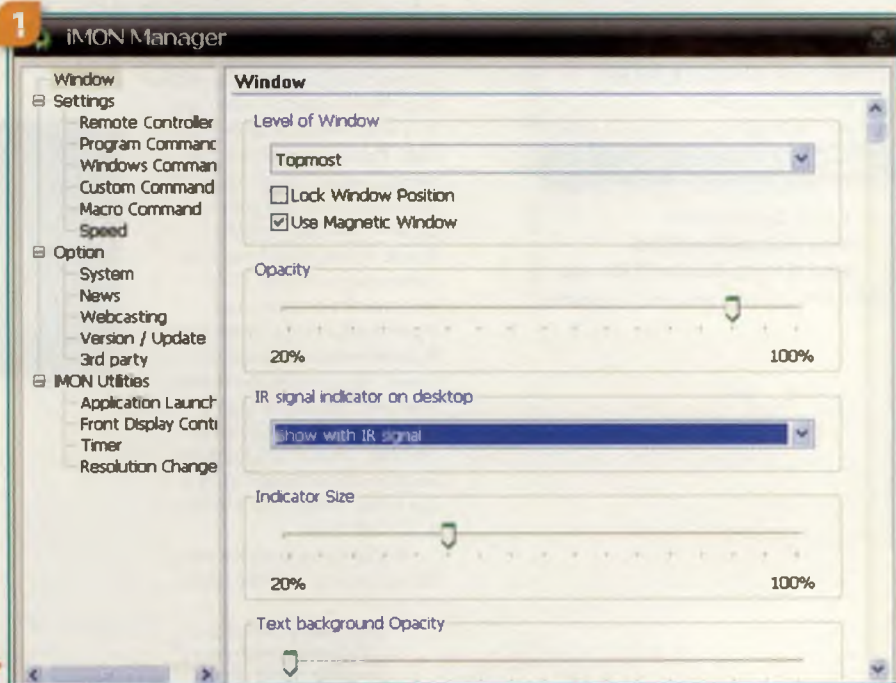
Media Lab is an OEM version of hardware and software from SoundGraph, so these notes aren't only applicable to Thermaltake products — the same hardware/software package is also

used in popular HTPC chassis from Silverstone and CoolerMaster, among others.

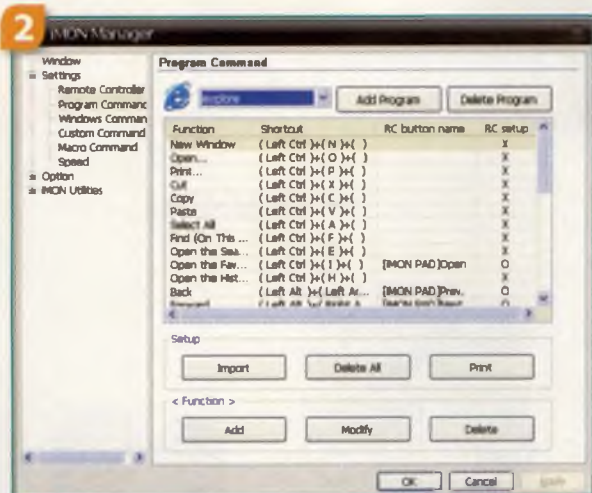
Version five of the SoundGraph software has been recently released and is available as a free download from the SoundGraph or Thermaltake web sites. The new version has a cleaner user interface and provides a way of customising access to internet news feeds and radio stations (previously this could only be achieved by manually editing the relevant XML files). Be sure to uninstall any older versions of the software before installing version five.

For some reason, the uninstaller doesn't remove the \Documents and Settings\All Users\Application Data\SOUNDGRAPH folder. We found the new software wouldn't work unless we manually deleted this folder prior to installation. It's important to also note that SoundGraph recommends you disconnect the Media Lab from the USB port while installing the new software.

A single installer loads all of the software. iMON is the program that monitors the IR receiver and maps the buttons to functions. We suggest you double-click the iMON tray icon and, in the Window section, set the IR signal indicator on the desktop to "Show with IR signal". This provides visual feedback that the remote has been pressed without the intrusiveness of a permanently floating status window.



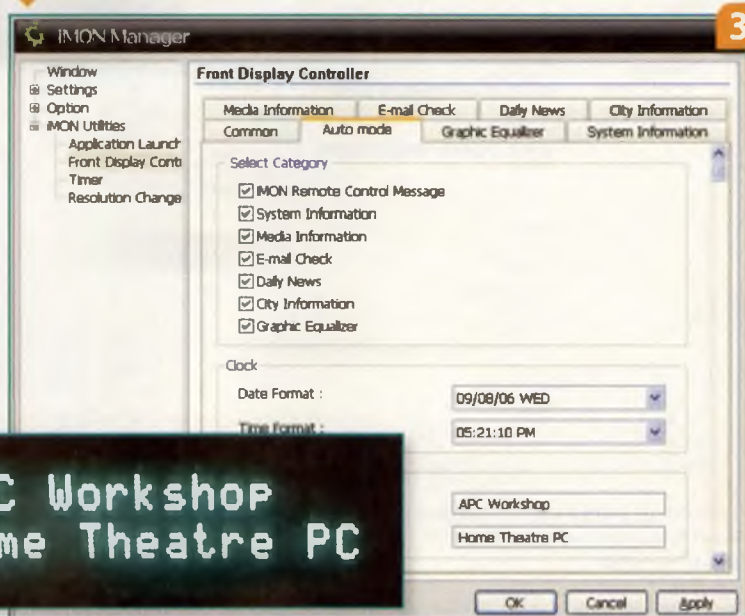
Avoid cluttering the screen by setting the IR indicator to display only when it receives a signal.



It's easy to map remote control buttons to an application's keyboard shortcuts using iMON Manager.

The VFD can display a message even when the PC is powered down.

Customise the information displayed on the VFD. We've changed the date and time format as well as the standby message.



APC Workshop
Home Theatre PC

IT'S LARGELY A MATTER OF PERSONAL TASTE, BUT THE AUTO MODE TAB LETS YOU ENABLE OR DISABLE CATEGORIES

The Settings > Program Command section lets you customise the button mappings for particular programs, but that's something you can leave for now. ❷ The remote can simulate a mouse and keyboard, so you can control practically any program. It's just more convenient to map the buttons to corresponding functions.

The iMON Utilities > Front Display Controller section is where you set the information presented on the front-panel display. It's largely a matter of personal taste, but the Auto Mode tab lets you enable or disable categories such as Daily News. ❸ While you're there, you'll probably want to change the date and time formats, and possibly the standby message ❹ that's displayed when the PC is shut down but still connected to the mains.

Check the Graphic Equalizer tab is set to the right sound device and disable any categories you don't care about in System Information.

The City Information tab is also worth a visit. Select any city to delete and click Remove; pick any city from the pop-up menu and click Add. All Australian capitals are supported.

If you want to use the email check feature, choose that tab, click Add, and enter the account information. We wouldn't use a work address — being reminded that 87 new emails have arrived would spoil our enjoyment of a movie.

One major feature of the latest software version is that you can easily add or delete RSS news feeds. Open iMON Manager and select Option > News. To add a completely new source, click the Add button in the News Category area. Then, in the Selected News Feed area, type in a name for the new category (eg. APC web site), the feed name (eg. Front-Page news) and the URL (eg. <http://www.apcmag.com/rss.xml>).

❺ Check the boxes to select which programs will

display that particular feed and click OK. (The new feed may not appear until the displaying program is restarted).

If you want to add a feed to an existing category, select that category in the News Category section, click New in the News Feed section and then proceed as before.

How do you find the URL? You'll need to look at the web page for the feed you want to use. Generally speaking, this will take the form of a text link or the RSS feed icon. For example, if you look at www.apcmag.com, you'll see a link in the top right under the search box labelled RSS feeds. That takes you to a page listing of all of the RSS feeds for the APC web site, and you can right-click on any of the links to copy the URL.

A similar process works for adding webcast stations. Creating a new genre automatically creates a new station entry, or you can select an existing genre and click Add in the Webcasting Station area. Type or paste the genre (if needed) or reuse an existing one, enter the station name and type or paste the URL: for example, Reggae, BigUp Radio Skankin' Ska, and <http://radio.bigupradio.com:8017>. If you've downloaded the station's logo from its web site, click the Browse button and navigate to wherever you stored it.

Again, the question is: "where does the URL come from?" You may find the information on the station's web site; failing that, download the playlist file for the station and open it in Notepad. That should reveal the URL.

iMEDIAN

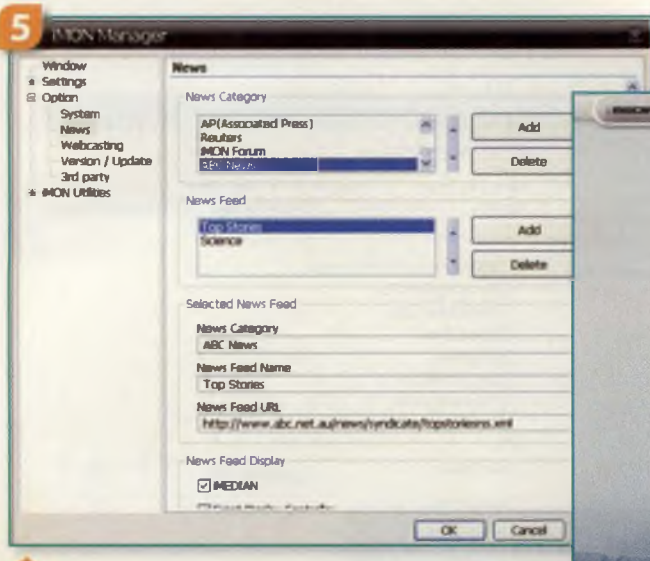
❸ The second part of the software package, iMEDIAN, provides the media centre functions, including music and movie playback, photo display, live and recorded TV, internet radio and news and weather reports.

The setup routine, which runs automatically, gives you the choice of using iMEDIAN's built-in TV software or whichever application was provided with the tuner — we chose the latter to ensure access to the 310i's digital, analogue and FM tuners. We did try iMEDIAN 5's digital tuner support, but it appeared to choke on the Pinnacle card. As a general rule, we'd recommend against using iMEDIAN's built-in TV software, as TV cards are notorious for quirky behaviour in non-tested applications.

If you go with the external application, ensure you have the tuner's documentation on hand, either in printed form or on another computer — you'll need to enter the keystrokes that correspond to the main commands (eg. channel up/down, volume up/down); plus, PDF documentation is inconvenient to read while iMEDIAN is running.

MEDIAPORTAL

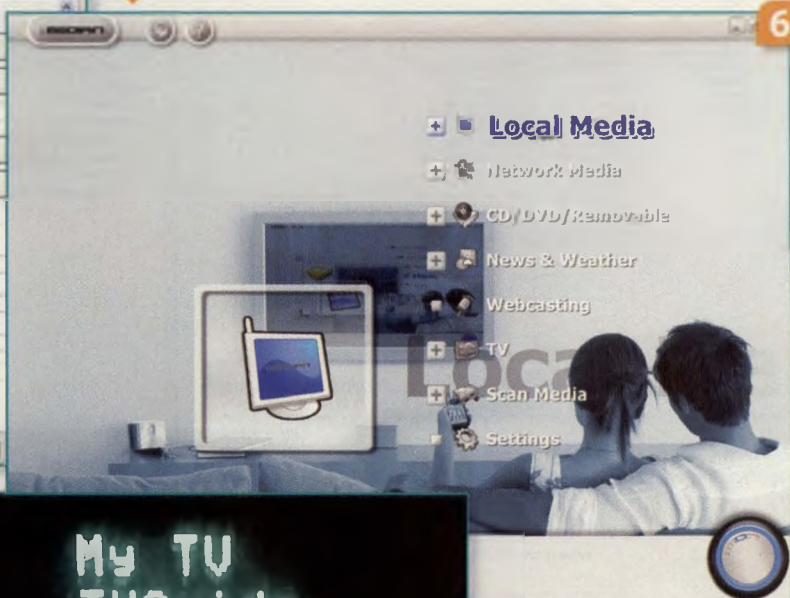
Since we wrote about the open source MediaPortal project in APC August (page 114), a "stable" 0.2.0.0 release and a subsequent update to 0.2.0.2 have appeared. While more robust than RC3, it's important to remember that it is still a work in progress.



If you're not satisfied with the standard news feeds, it's now easy to add your favourite sources.

The C.All plug-in sends MediaPortal's menu selections and status displays to the VFD.

iMEDIAN is SoundGraph's media centre application, capable of playing local, network, internet and broadcast content.



7



THE ADVANTAGE OF MYKEYS IS THAT IT PROVIDES KEYSTROKE ACCESS TO MEDIAPORTAL SCREENS INCLUDING MYTV

Two MediaPortal plug-ins are especially useful for our hardware: MyKeys (jump to screens using keystrokes) and C.All ("processes media information, messages and menus and sends the data to your LCD/VFD software"). Download them via www.team-mediaportal.com/files/Download/Plugins/.

The advantage of MyKeys is that it provides keystroke access to MediaPortal screens including MyTV. You can then tell the remote control software to map the special-purpose buttons to the corresponding keystrokes.

To install it, copy MyKeys.dll to C:\Program Files\Team MediaPortal\MediaPortal\Plugins\Process. Run Setup MediaPortal, select Plugins and look for C.All in the Process Plugins section. Right-click it and select Disabled (to enable the plug-in), then right-click again and select Configuration. You can't change anything, but you need to print or write down the list of screens and keystrokes.

Double-click the iMON system tray icon and choose Settings > Program Command. Click Add Program and navigate to the MediaPortal application. Click Yes to add MediaPortal to the iMON launcher — that way you'll be able to open it with the large button on the remote beneath the D-pad. Click Add, type in the name of the function (eg. TV) and click Next. The next window contains three boxes to allow for modifiers such as Shift or Control, but we only need a simple keystroke. Click in the first box and press T. (Don't be confused: MyKeys uses "t" to select TV, but as we haven't told iMON to simulate the Shift key, all will be well.) Click Next, pick the appropriate button (eg. MyTV) from the

pop-up menu and click Finish. Repeat the process for any other commands you want to set up. Click OK to close iMON Manager.

C.All works with the iMON hardware, but the instructions are patchy. Installation involves copying the individual files within the C.All\MediaPortal\Plugins\Process folder (the exact path will depend on where you unpacked the ZIP archive) into the corresponding subfolders of C:\Program Files\Team MediaPortal\MediaPortal\Plugins\Process. You also need to copy C.All\MediaPortal\Interop*.x to C:\Program Files\Team MediaPortal\MediaPortal\, and C.All\MediaPortal\Plugins\Process\C.All\borIndmm.dll to C:\WINDOWS\system32.

Run Setup MediaPortal, select Plugins and look for C.All in the Process Plugins section. Right-click it and select Disabled (to enable the plug-in), then right-click a second time, select Configuration and follow the instructions in the C.All manual — you'll need to know that the Thermaltake iMON display has two lines of 16 characters. In the Screens tab, change the definition of the NothingToShow screen so that something useful is shown in the otherwise blank second line, eg. Line2=\$#time\$. Double-click on an entry to edit it. Remembering how to type the \$ is a chore, so it's probably quicker to copy and paste the string from another entry.

When you're done, click OK to close the configuration window and click OK again to exit Setup MediaPortal.

Right-click the iMON icon in the system tray and select iMON Utilities > Front Display Controller. Click the Plug-In button. If you subsequently want to restore normal operation of the display, repeat the process but select Auto instead of Plug-In.

C.All uses a small program called MPiMon (found in C.All\AddOns\iMon) to connect MediaPortal and iMON. Rather than running it manually, make it part of Windows' startup group: select Start > All Programs > Startup to open the Startup folder, then create a shortcut to MPiMon in that folder. Restart the computer to check your work or, if you're feeling confident, just launch MPiMon.

Run MediaPortal, and the front-panel display should reflect your menu choices.

Not everything is displayed, but you will see things such as the (truncated) name of the currently playing CD track. **APC**

NEXT MONTH

- Next month, we'll look at connecting a media PC to other home entertainment equipment.

Substitute Ninja

Now you can make your own Flash-based mini game, with or without additional programming. *David Emberton* supplies the engine — you bring the graphics.

DAVID EMBERTON

David Emberton got his start as a bored IT trainee, posting free programming tutorials online when nobody was looking. Out of that, he has ended up writing books, giving talks and working for some great companies worldwide. David's main interests now are internet software, creativity and geek health.



SKILL LEVEL

Intermediate

TIME TO COMPLETE

Two hours

REQUIREMENTS

Flash MX 2004 (or newer)

INSIDE INFO

- Adobe Flash 8 Trial
www.adobe.com/go/tryflashpro
- Ninja Star source code
www.apcstart.com/dload
- ActionScript tutorials
www.actionscript.org

The game we're talking about in this Workshop is called Ninja Star. Similar to the original classic Whack a Mole game, Ninja Star has identical gameplay, except this time there are ninjas hiding behind the wall, and instead of whacking sticks you get an endless supply of metal throwing ninja stars. The scripting used is ActionScript 2.0, but the game file itself can be opened in Flash MX 2004 through to 9 (alpha), and is set to export for Flash Player 7.

FAMILIARISE

Grab the project source file from our web site and take a look at the file structure. The game itself is stored as Game.fla and is supported by three ActionScript class files named Weapon, Target and Shooter. If you don't know ActionScript, or don't need to change the mechanics of the game, you can leave these class files intact and just edit the FLA symbols and timeline.

Open Game.fla and observe that it is composed of three scenes. The first scene is an Intro, with a splash graphic and a play button, the second is the Game (and contains the main action) and the final scene shows a Win animation (and another play button). Each scene is divided into logically named layers that you can add to or rearrange.

The game itself works by spawning three instances of a Target object, one Shooter object, and as many Weapon objects as it takes to succeed. The Shooter acts as a cursor, following the mouse from side to side, and the Weapons animate upwards toward the location of a vulnerable Target. A recurring function checks for collisions between weapons and targets, and if there is one, the game is won.

To make the game longer and more challenging, try adding a health meter or minimum hit counter so that multiple targets must be conquered before the win screen appears. You can also add video to the final scene, or even integrate sounds by attaching them at key points on the timeline (or with ActionScript).

CUSTOMISING

To swap out the graphics in the Game scene, open up the Library window. Inside the folder marked Graphics, you'll find Target Graphic and Weapon Graphic. Double-click to edit each of these and copy and paste your own characters inside, adjusting the dimensions to roughly match the original. At this point, you can use Test Movie to see the changes.

Next, go back to the Game scene and change the Background layer to suit the new imagery you're using. The background scenery you choose may affect the required motion of the targets as they slide in and out of view, and if this is the case you can just drag them around and resize them as needed. The scripting has been designed so that as long as a target object is visible on screen it can be hit, without any additional modifications.

To change the various animation elements, edit the primary Target, Weapon and Shooter symbols from the Library window. Each of these can be altered quite heavily, just be sure to notice inside the Target clip where the vulnerable property is being set to true or false (on the Actions layer), and adjust this accordingly.



Shoot 'em up: Flash's dual-animation and scripting engines make it easy to create games like this one.



iPod: More than a music box

The iPod might have started life as a music player, but *Anthony Caruana* shows you how it can be a whole lot more than that.

ANTHONY CARUANA

Anthony Caruana is an IT professional and long-time PDA user whose personal stash of devices is almost a perfect timeline of their evolution. Anthony, who ran the Melbourne Pocket PC User Group for two years, is also involved in the deployment and use of PDAs in corporate environments. Aside from keeping his life organised, Anthony uses handhelds for gaming, playing music and podcasts, and watching movies on-the-go.



SKILL LEVEL

● Beginner

TIME TO COMPLETE

● 30 minutes

REQUIREMENTS

● iPod (configured for disk access is best); PC running either Windows or OS X.

INSIDE INFO

- PocketMac
www.pocketmac.com
- Griffin Technology
www.griffintech.com
- iPod Linux
www.ipodlinux.org
- Apple iPod
www.apple.com/ipod
- PodTender and PodGourmet
www.enrriqueinterodesign.com
- Bible Player
www.bibleplayer.com
- iWorkout and iPurseona
www.helmesinnovations.com
- Pod Secret
www.pariahware.com
- K-pod
<http://k-deep.com/k-pod.htm>
- Pod2Go
www.kalnjoy.com

Batman's Utility Belt might have started life as a clever device to keep his pants up, but it evolved into so much more. Similarly, the iPod started as a music player, but firmware updates and refreshed hardware mean it can become the hub of a digital life and not just a modern-day music-box.

PIM MAGIC

Let's start with the basics. Sitting under the Extras menu on your iPod are the Calendar, Contacts and Notes applications. For Mac users, these are easy to set up to sync with iCal and Address Book, but PC users will need to look for third-party solutions. PocketMac (don't be fooled by the name) makes PocketMac iPod Edition for Windows. This app sits in the System Tray and waits for your iPod to connect. When it does, it grabs your Outlook calendar and contacts and exports them to your iPod. While your iPod won't allow any data entry, it's a handy way to keep your diary and contacts close by. For Mac users, there's an Entourage-ready version of the software as well. In fact, with PocketMac, when you buy the Windows version you get the Mac one free (and vice-versa).

As well as automatically converting and exporting PIM data to the iPod, PocketMac will also reformat and copy files such as PDFs, Word, Text and Rich Text documents.

PORTABLE HARD DISK

Using your iPod as a portable hard disk is dead easy. Connect your iPod and fire up iTunes's Preferences. Go the iPod section and enable disk use. This will allow you to use the free space on your iPod as a removable hard drive. By packing your cable you have a ready-made high capacity sneakernet for when you're on the road. As a bonus, your iPod can also be used to backup critical data while you're travelling.

An extension of the portable hard disk scenario is to make it a boot device. For Mac users this only works with 4th-gen or older devices, as you'll need

the FireWire interface. This was dropped for the nano and 5th-gen devices.

On a Mac, you'll need to connect your iPod and use the Disk Utility to erase its contents. Once that's done, insert your OS X DVD and fire up the installer. When prompted for the destination, make sure you select the iPod and then follow the prompts. To toggle between the internal hard drive and your iPod, use the Start Up Disk applet in Preferences.

Similarly, you can use a utility like BartPE (www.nu2.nu/pebuilder) to set up your iPod as a bootable drive that Windows can be installed on. All you'll need to do is make sure your BIOS is set to boot from USB devices.

A word of warning — only use your iPod as a bootable drive in emergencies. The hard disk in the iPod is not designed to the same tolerances as a desktop drive. Also, the iPod's case isn't ventilated, so the drive is more susceptible to overheating. Apple's warranty may not cover a device that the company believes has been abused.

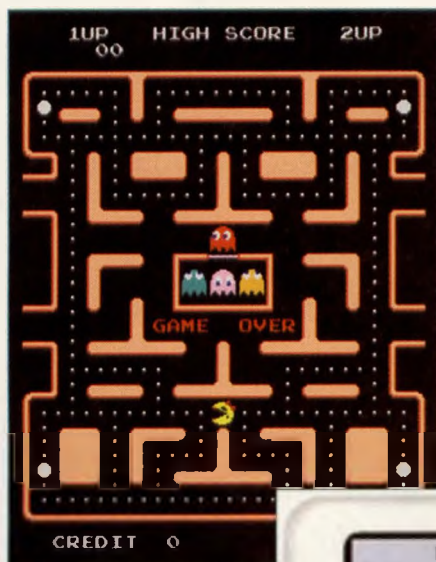
MAKE A NOTE

Once your iPod's set up as an external hard drive, you can use it to store all kinds of information. For example, if you're travelling and you use WhereIs (www.whereis.com.au) for grabbing driving directions, then you can copy/paste the directions into a text note and save that to your iPod. You can use a passenger to read the directions to you while driving or you can take a quick peak when you're stationary.

You can extend this by using a text-to-speech converter to convert notes and other documents to audio files. These can then be synchronised to your iPod via iTunes. Natural Voice Text to Speech Reader (www.naturalreaders.com) is a free application that can convert any text (even stuff in the clipboard) to the spoken word. The free version uses a very dull electronic voice, but upgrading to the Professional version gets you natural voices — you can even use your own. This is a good way of

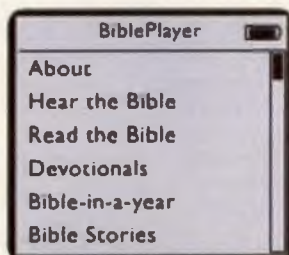


Let's get physical: as well as using your iPod for some motivation at the gym, with iWorkout you can even get instructions on how to get those squats happening.

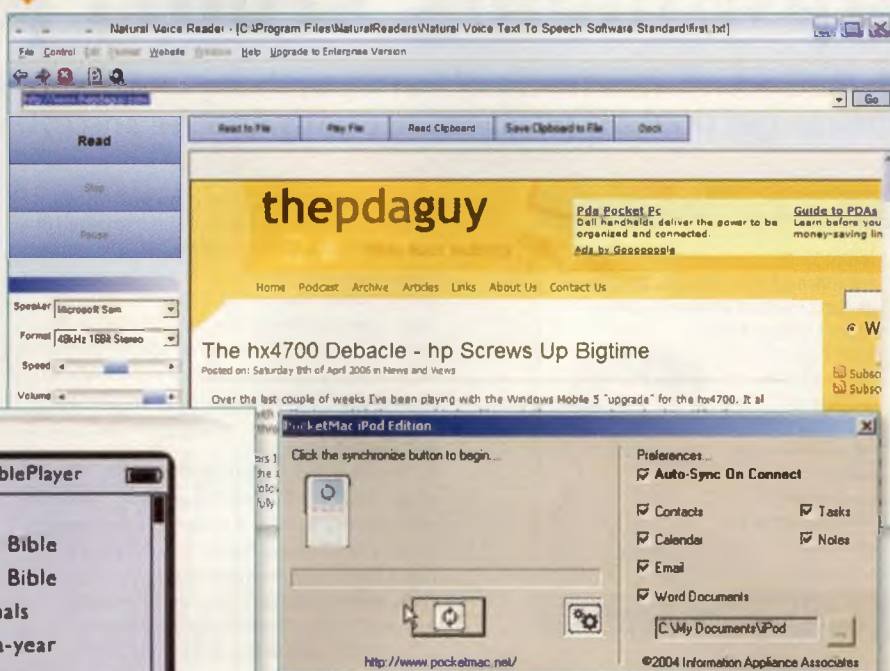


Once your iPod gets the Linux treatment, you can load MAME and get back into your favourite retro games.

Given the iPod's ability to deal with text, it's natural that the bible has made it to the iPod.



Using a text-to-speech utility lets you listen to your notes on the go.



Extending your PIM to your iPod provides for a great way to keep track of your day without carrying yet another device.

keeping up with news and some of that missed reading you can never get done before work.

PENGUINS AND DEATHMATCHES

It's easy to forget but the iPod is a piece of hardware running its own operating system (and that the operating system can be changed for another one). There are a few Linux ports that will transform the iPod into a small member of the penguin parade.

Download Podzilla from www.ipodlinux.com. The first three iPod generations are officially supported, fourth-generation iPods work but nanos and fifth-generation units aren't supported — yet. That said, there's an iPod MAME (multi arcade machine emulator), so you can play Pacman on a 5th-gen iPod. Just don't ask for support if something goes screwy.

Podzilla's bootloader lets you choose between Linux and the native iPod software at startup. Getting back to factory setup is easy, as Apple's iPod



ONCE YOUR IPOD'S SET UP AS AN EXTERNAL HARD DRIVE, YOU CAN USE IT TO STORE ALL KINDS OF INFORMATION

Updater will restore your iPod's firmware. In fact, the worst thing that can happen as a result of giving your iPod the penguin treatment is that you could lose some data. If the OS gets trashed, Apple's Firmware Updater will get you back to an out-of-the-box iPod.

Once you're running Podzilla, a new world of applications opens up. With the iPod's click-wheel and a port of Doom (www.ipodlinux.org/Doom) you can use the clickwheel to navigate the depths of hell to murder some demons.

As well as Doom, there's a heap of other games and apps — ranging from iPod to iPod transfer

tools, Periodic Tables, Conversion programs and even a web server.

FOR THE ROAD WARRIORS

Pod Secret (www.pariahware.com) allows you to store encrypted notes, credit card details, bank account numbers, serial numbers, passports, driver's licences (or any other data that you wish) on an iPod for convenient portable access. In fact, coupled with the Screen Lock feature on the latest iPods, you have a secure store for data on the go.

K-pod (<http://k-deep.com/k-pod.htm>) synchronises your mailboxes with your iPod. Rather than syncing with your mail client, K-pod retrieves messages directly from your POP or IMAP provider and stores them as text notes on your iPod. The app is dead easy to configure and just needs your iPod to be enabled as a hard disk.

Pod2Go (www.kainjow.com) has been one of the real leaders on the Mac scene in terms of getting non-musical content to the iPod. They're currently beta-testing a Windows version of their software that'll let you sync RSS feeds as well as a stack of other services like movie reviews, stock prices and horoscopes. **BTC**

JUSTIFYING AN IPOD WITH THE BOSS

- 1 The iPod makes a great portable hard drive. It looks good, it's tough and it's designed to be carried in your bag or pocket.
- 2 Using an accessory like the Griffin iTalk, you can use it for recording meetings, speeches and personal voice notes.
- 3 As a read-only PIM, it's a great way to keep your diary with you.
- 4 Download Podcasts and use FM transmitters like the iTrip to listen in your car.
- 5 The iPod is the funkiest paperweight in the world. Okay, okay: so, I'm grabbing at straws here — but it looks better than a boring crystal block, doesn't it?
- 6 Using your iPod at work means that it might qualify as a tax deduction.



Optimising LAMP, part 2

In the second instalment of our Optimising LAMP series, *Jarrold Spiga* explains how to get the best performance with Apache and PHP.

JARROD SPIGA

Jarrold Spiga is an infrastructure and network engineer who specialises in getting Linux and Windows systems happily coexisting with each other. He currently holds CCNA and numerous MCP certifications, and dabbles in Web application development in his spare time.



SKILL LEVEL

Intermediate

TIME TO COMPLETE

Two hours

REQUIREMENTS

An Apache HTTP web server and PHP installation.

IN THIS SERIES

- Part 1 – December '06
Linux and MySQL
- Part 2 – January '07
Apache and PHP
- Part 3 – February '07
Benchmarking and tuning

While optimising your Linux and MySQL backend environments (as explained in last month's Optimising LAMP, APC December 2006, page 114) can give you a fairly significant performance boost on your server, they aren't the only things that you can tweak. By generating the HTML code on the server that will be sent to the client in the most efficient manner possible, further optimisations can be made.

WHICH VERSION OF APACHE SHOULD I BE RUNNING?

When version 2.0 of the Apache web server was released, performance was one of the biggest issues stopping webmasters from upgrading. While the newer development branch served static content in a quicker way, substantial degradations to the performance of many dynamic shared objects (including PHP) were recorded.

However, this was primarily due to the relative immaturity of the PHP's Apache 2 API. Over a few months, this situation improved dramatically with subsequent releases of PHP.

Compatibility is generally the only reason why anyone should consider running version 1.3 of the Apache web server these days. In the last couple of months, version 2.2 has become the Apache Software Foundation's version of choice, but many people are yet to be satisfied that this version is the best. In any case, most users should be using the latest build of version 2.0.

It's also prudent to upgrade the Apache web server to later builds as they are released to protect your server against various security vulnerabilities (in particular, to prevent recently discovered cross-site scripting (CSS) exploits).

SQUEEZE THOSE BITS!

Unless you're using a dated system for your web server, the CPU is rarely the bottleneck — bandwidth is (especially at the client end). The mod_deflate Apache module can compress the text-based data (ie. HTML, text and XML data) on the server before transmitting that information to the client, reducing the bandwidth required for the transfer and providing faster load time for clients (especially those on low-bandwidth connections).

However, it should be noted that not all types of data compress very well. Most image files are already compressed and getting Apache to compress them again often makes for a bigger image file — so mod_deflate should really only be enabled for certain MIME types.

To enable mod_deflate, ensure that the following line is uncommented from your /etc/httpd/conf/httpd.conf file:

```
LoadModule deflate_module modules/mod_deflate.so
```

Then, to enable it for the text-based MIME types, add the following line to your configuration:

```
AddOutputFilterByType DEFLATE text/html text/plain text/xml application/x-httpd-php
```

The other thing to be wary of is that not all browsers support gzip-compressed content. As such, you should also add the following lines to server uncompressed data to these browsers:

```
BrowserMatch ^Mozilla/4 gzip-only-text/html
BrowserMatch ^Mozilla/4.[0-6] no-gzip
BrowserMatch \bMSIE! no-gzip !gzip-only-text/html
```

DISABLE UNUSED MODULES!

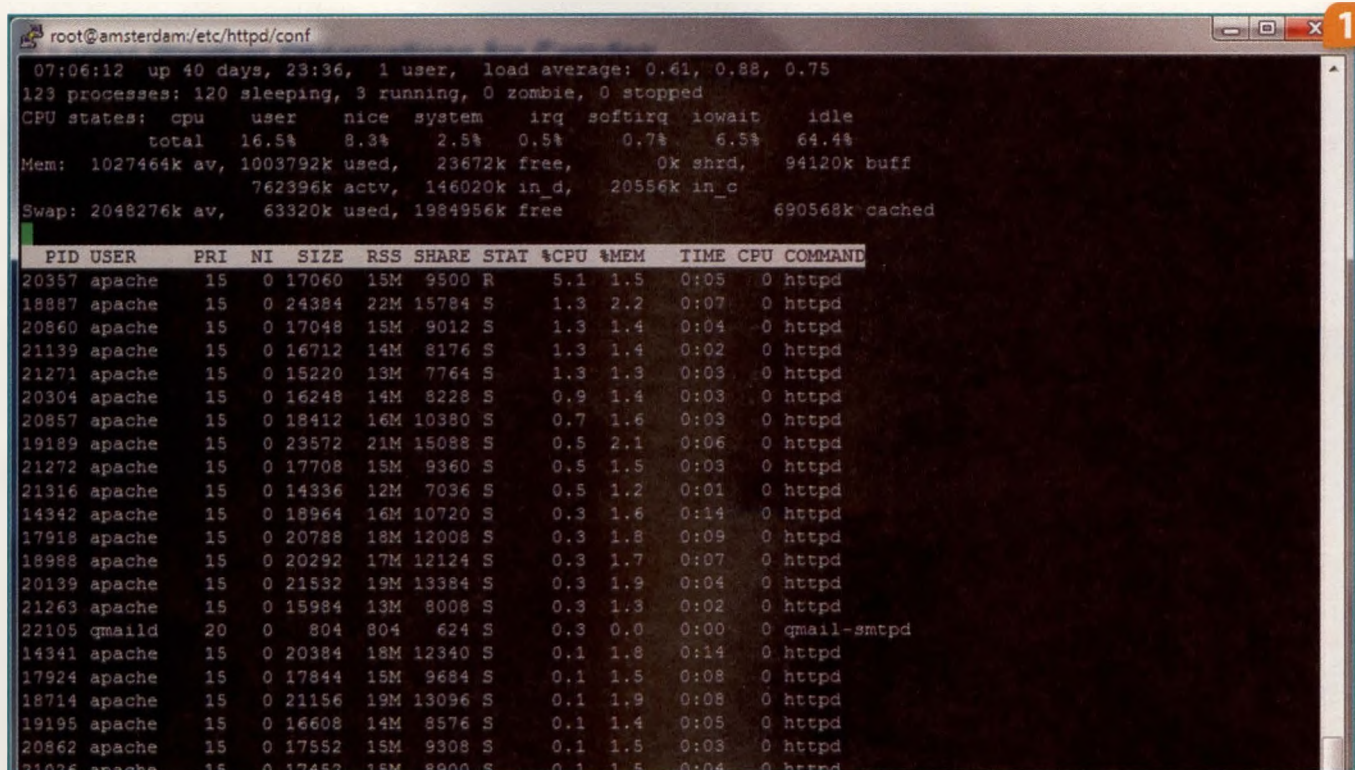
A default Apache 2.0 installation is configured to run over 30 Dynamic Shared Objects, or modules. This consumes a lot of RAM that could be used for so many other purposes. In order to free up this memory, review what each module does (extensive documentation can be found at <http://httpd.apache.org/docs/2.0/mod/>) and disable what you don't need to use for your site.

In particular, just about everyone can disable mod_imap, mod_mime_magic and mod_unique_id. On the other hand, most servers would not be able to get by without having mod_access, mod_alias, mod_dir, mod_mime and mod_log_config enabled.

KEEPING THINGS IN RAM

The settings which govern how Apache spawns child processes can have a dramatic impact on the responsiveness and performance of your server. There is no "one setting" that is the best for all installations. If you configure aggressively, memory usage will approach the limit, forcing Apache to rely on swap space — killing performance. If you configure conservatively, memory resources are essentially wasted.

The most important directive in terms of capacity planning for your server is the MaxClients directive. Many people make the mistake of setting MaxClients to 256 (which is the maximum and default setting). This itself can be a server killer if you experience a surge in traffic. In order to set this directive correctly, you need to do some calculations.



```

root@amsterdam:/etc/httpd/conf
07:06:12 up 40 days, 23:36, 1 user, load average: 0.61, 0.88, 0.75
123 processes: 120 sleeping, 3 running, 0 zombie, 0 stopped
CPU states:  cpu   user   nice   system   irq   softirq   iowait   idle
              total 16.5%   8.3%   2.5%   0.5%   0.7%   6.5%   64.4%
Mem:  1027464k av, 1003792k used, 23672k free, 0k shrd, 94120k buff
      762396k actv, 146020k in_d, 20556k in_c
Swap: 2048276k av, 63320k used, 1984956k free 690568k cached

  PID USER   PRI  NI  SIZE  RSS SHARE STAT %CPU %MEM   TIME CPU COMMAND
  20357 apache   15   0 17060 15M  9500 R    5.1  1.5   0:05  0 httpd
  18887 apache   15   0 24384 22M 15784 S    1.3  2.2   0:07  0 httpd
  20860 apache   15   0 17048 15M  9012 S    1.3  1.4   0:04  0 httpd
  21139 apache   15   0 16712 14M  8176 S    1.3  1.4   0:02  0 httpd
  21271 apache   15   0 15220 13M  7764 S    1.3  1.3   0:03  0 httpd
  20304 apache   15   0 16248 14M  8228 S    0.9  1.4   0:03  0 httpd
  20857 apache   15   0 18412 16M 10380 S    0.7  1.6   0:03  0 httpd
  19189 apache   15   0 23572 21M 15088 S    0.5  2.1   0:06  0 httpd
  21272 apache   15   0 17708 15M  9360 S    0.5  1.5   0:03  0 httpd
  21316 apache   15   0 14336 12M  7036 S    0.5  1.2   0:01  0 httpd
  14342 apache   15   0 18964 16M 10720 S    0.3  1.6   0:14  0 httpd
  17918 apache   15   0 20788 18M 12008 S    0.3  1.8   0:09  0 httpd
  18988 apache   15   0 20292 17M 12124 S    0.3  1.7   0:07  0 httpd
  20139 apache   15   0 21532 19M 13384 S    0.3  1.9   0:04  0 httpd
  21263 apache   15   0 15984 13M  8008 S    0.3  1.3   0:02  0 httpd
  22105 gmaild   20   0   804   804   624 S    0.3  0.0   0:00  0 gmail-smtpd
  14341 apache   15   0 20384 18M 12340 S    0.1  1.8   0:14  0 httpd
  17924 apache   15   0 17844 15M  9684 S    0.1  1.5   0:08  0 httpd
  18714 apache   15   0 21156 19M 13096 S    0.1  1.9   0:08  0 httpd
  19195 apache   15   0 16608 14M  8576 S    0.1  1.4   0:05  0 httpd
  20862 apache   15   0 17552 15M  9308 S    0.1  1.5   0:03  0 httpd
  21026 apache   15   0 17452 15M  8900 S    0.1  1.5   0:04  0 httpd

```

The calculation process: use top to calculate how many Apache processes can be spawned without using swap space.

Execute the top command on your server and note down how much memory each of your httpd child processes is currently using (look at the RSS column). Secondly, determine how much memory is currently being allocated towards system cache, how much is being allocated to all Apache processes, how much memory is free and how much swap space is in use. Your MaxClients setting should be: (free memory + sum of Apache process usage + system cache - swap space in use) / the maximum amount of memory used by a single Apache process.

Looking at the screenshot above, there is currently ~23MB of free RAM, ~690MB dedicated to system cache, ~336MB currently allocated to Apache processes and ~63MB of swap space in use. (The processes using up to 22MB RAM each).

As a result, setting MaxClients on this server to any value greater than 45 would be ill-advised. If 46 simultaneous connections are made to the server, all RAM resources would be exhausted forcing Apache to use swap space to server requests, slowing page load times significantly.

If MaxClients was set to 45, the last connection would be queued up for processing once one of the other 45 requests were served. By setting the MaxClients directive correctly, you ensure that the maximum number of requests are processed in the quickest time possible.

WON'T SOMEBODY THINK OF THE CHILDREN? The MaxClients directive isn't the only one that controls when and how child processes are



BY GENERATING THE HTML ON THE SERVER SENT TO THE CLIENT, FURTHER OPTIMISATIONS CAN BE MADE

created. The StartServers directive (which is set to 5 by default) determines how many Apache processes are created when the daemon is started. In general, this directive doesn't need changing; but if you have a busy site and arrange for Apache to be restarted regularly, setting this to a higher value will ensure that there are more processes available for requests as soon as your web server starts.

The MinSpareServers and MaxSpareServers directives govern how many idle processes are created to sit by in an idle state waiting for new requests (by default, this is set to 5 and 10 processes respectively). Apache creates (or kills) new processes at the beginning of each second — in an ideal configuration, you'll have enough spare processes to handle any new requests that are likely to be received within a second, without having too many idle processes consuming memory. If you have a bursty traffic pattern (you get dozens of requests one minute and hardly any the next), it's probably worthwhile increasing the values for these directives.

While on the topic of spare servers, it's a good idea to remember the rate at which new idle child processes are created. If the number of

idle child processes drops below the MinSpareServers threshold, one new child is created initially. If the threshold has still not been met after one second, another two idle children are created. If the situation isn't rectified after two seconds, another four idle children are created. The number of children doubles with each successive second until the threshold is met, or until 32 child processes are created per second. You should always set your MinSpareServers and MaxSpareServers setting with this rule in mind.

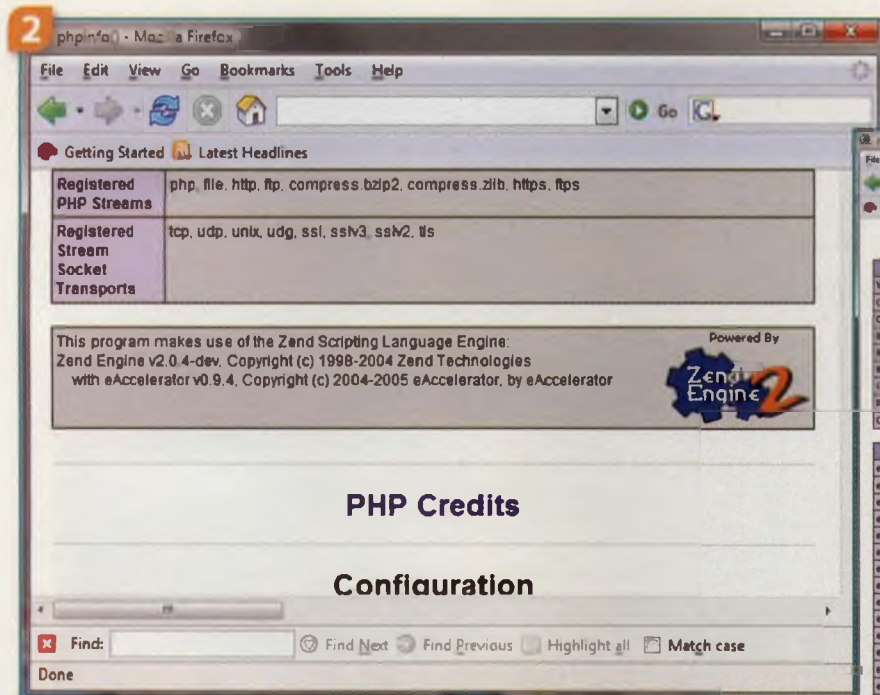
Lastly, the MaxRequestsPerChild directive is useful if you suspect that there may be a memory leak on your server. For the best performance, this should be set to 0 — meaning that Apache will never kill child processes (unless the MaxSpareServers threshold is exceeded). However, if you have stability concerns over the server, consider assigning a value between 100 and 10,000 to routinely kill and restart processes, minimising the impact of any memory leak that may be occurring.

STAYIN' ALIVE

The question of whether to enable "keep-alives" depends on your specific installation. In the



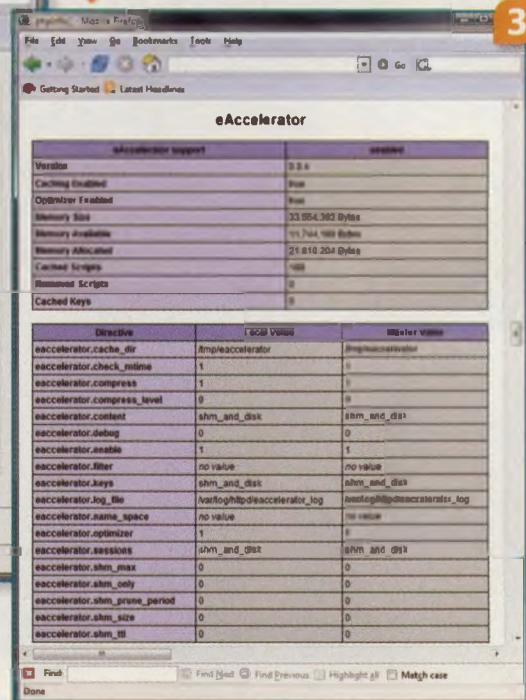
Cache stats: the `phpinfo()` output can also provide statistics on how your eAccelerator cache is performing. 21MB of cached scripts are a lot of pages!



PHP Credits

Configuration

eAccelerator is usually run as an extension to the Zend engine that drives PHP. If eAccelerator isn't listed here, it isn't enabled.



```
export PHP_PREFIX="/usr"
$PHP_PREFIX/bin/phpize
./configure --enable-eaccelerator=shared --with-
php-config=$PHP_PREFIX/bin/php-config
make
make install
cp eaccelerator.ini /etc/php.d
mkdir /tmp/eaccelerator
chmod 0777 /tmp/eaccelerator
```

Once eAccelerator is compiled and installed, open up the `/etc/php.d/eaccelerator.ini` file in your favourite text editor, then read it and make any adjustments that you feel are necessary. Once you've done that, restart Apache to activate eAccelerator.

② You can verify that eAccelerator is running by looking at the output from the `phpinfo()` function, as shown in the image above. ③ You can also view how eAccelerator is performing in our third figure. [BUC](#)

NEXT MONTH

- The third and final part of Optimising LAMP will show you how you can determine whether the optimisations that you're attempting are actually making a difference — by looking at benchmarking and stress-testing your server.



COMPLETELY REGENERATING THE ENTIRE PAGE EACH TIME SOMEONE VISITS IS A WASTE OF RESOURCES

original HTTP specification, a web browser had to establish a unique connection for every item on a page — one for the html, one for each image etc. In order to reduce the amount of overhead that this generated, the keep-alives extension allows browsers to re-use the same socket connection to the server for multiple transfers.

This is usually great if you are using Apache to serve up all of your content. However, if you're using TUX or another web server to send your images, keep-alives should be disabled.

If you enable keep-alives, the `KeepAliveTimeout` should be set to a couple of seconds greater than how long it usually takes for most of your visitors to load any page on your server. If all of the pages on your site load for a typical ADSL user in less than five seconds, that would be an appropriate setting for most clients. If a dial-up user takes 12 seconds to download a given page though, at least three socket connections would need to be made in order to transfer all data on that page.

EACCELERATOR

Turning our attention toward PHP, the trick is to try to optimise the efficiency with which your

scripts can be executed. The easiest way to get a quick boost to PHP performance is to implement eAccelerator — an application that caches PHP scripts in their compiled state so that they don't need to be compiled each time that a page is loaded.

Take the `apcstart.com` home page for example. This single page is viewed thousands of times each day by different people, yet only goes through a few updates at different times per day. The main page only varies when a new story is added, and the subpages only vary when a comment is added. Completely regenerating the entire page each time someone visits is a waste of resources. eAccelerator dramatically reduces the computational overhead involved in generating frequently visited PHP pages.

Building eAccelerator can be a bit tricky. The first step is to download the latest version from <http://sourceforge.net/projects/eaccelerator/>. Then, run the following commands as the root user:

```
tar -jxvf eaccelerator-0.9.5.tar.bz2
cd eaccelerator-0.9.5
```


Yahoo!'s CSS turbo boost

They're not the most glamorous parts of the Yahoo! UI library — but they may just be the most useful. *David Emberton* tries out three YUI CSS tools.

DAVID EMBERTON

David Emberton got his start as a bored IT trainee, posting free programming tutorials online when nobody was looking. Out of that, he has ended up writing books, giving talks, and working for some great companies worldwide. David's main interests now are internet software, creativity and geek health.



SKILL LEVEL

● Advanced

TIME TO COMPLETE

● One hour

REQUIREMENTS

● HTML editor; CSS-capable browser(s).

INSIDE INFO

- YUI: CSS Grid Builder <http://blog.davglass.com/files/yul/grids/>
- Yahoo! Developer Network <http://developer.yahoo.com/yul/>
- HTML 4.01 Strict <http://www.w3.org/TR/html401/>

The Yahoo! User Interface library (YUI) is an intimidating collection of widgets and gizmos offered for free under the BSD open source licence. The YUI consists primarily of JavaScript files and dynamic HTML, for the purpose of making Web 2.0-style page development easier.

What we're looking at right now, though, is a small but compelling subset of this library called the YUI CSS tools. So far there are three of these tools: Reset, Fonts, and Grids. Between them, they solve many of the foundational problems associated with cross-browser page rendering and coding. This advanced overview will give you enough to whet your appetite; from here you should consult the available documentation.

The Reset, Fonts, and Grids tools are all available as separate style sheets. But they're also available in a combined, optimised CSS file named "reset-fonts-grids-min.css". You can grab this version from Yahoo's online example area, or download the entire YUI from SourceForge and find it in the latest build. By linking this style sheet to your page, you automatically get all the CSS styles you need to get started.

RESET

Modern CSS-enabled browsers are notorious for their differences in default rendering behaviour for various HTML elements. Paragraphs, form controls, divisions: all these can and do vary in appearance from browser to browser. The Reset tool comprehensively zeroes all presentation settings for common items so that everything you do to style your pages then becomes deliberate. For instance, a <div> will only take on padding or margins if you explicitly say so.

Start with a blank HTML page in an editor like Dreamweaver 8, setting the document type to

HTML 4.01 Strict (Yahoo's recommended format for implementing the YUI). Then link to the reset-fonts-grids-min.css style sheet to enable the Reset tool. To override any of the Reset settings and customise the appearance of core elements, add rules for them to your page's own style sheet definition.

FORMATS

The YUI Fonts tool is a set of text-rendering rules designed to maximise legibility and readability. Line height and relative font sizing are standardised so that any text will look its best. Interestingly, type sizes in the YUI world are not expressed in fixed units, but rather percentages of the Fonts-defined baseline. This takes some getting used to, but a conversion table to common pixel sizes is provided.

Try adding some paragraphs, lists, and form elements to your page and preview it to see how the Fonts tool affects them. Customisation is as simple as adding new font-family and font-size definitions to override the defaults. As always, a font-family setting will only render correctly if the end user has that font installed, otherwise it will degrade silently to the next available option.

GRIDS

Most web pages employ a predictable set of grid patterns to present content. The YUI Grids tool encompasses these patterns, making them available as a collection of <div> classes and suggested nesting structures. Using the pre-defined system of blocks, grids, and units, it's possible to create any complex layout without resorting to the use of HTML tables.

First, study the YUI Grid examples to get a feel for how blocks, grids, and units interrelate. Then, choose a template to get started

with and populate it with standard items like navigational links, body paragraphs (etc.) and style them. The Grids don't seem to render very well in Dreamweaver's WYSIWYG view, so consider using Dav Glass' excellent visual tool to experiment with them online.

To finish off, complete your test page markup and preview it in each of the browsers you have installed on your machine (to verify that it renders faithfully).



Something for nothing: YUI CSS condenses the wisdom of Yahoo! markup experts into a tiny reusable style sheet.



Get tricky with your wiki

Set up the perfect tool for collaboration and teamwork — and make it your own. *Peter Sbarski explains how.*

PETER SBARSKI

Having received first-class honours in Computer Science at Monash University, Peter is currently undertaking a postgraduate degree. He also consults businesses on IT matters and develops custom software solutions. Peter enjoys programming, writing and fragging opponents.



SKILL LEVEL

● Intermediate

TIME TO COMPLETE

● Two hours

REQUIREMENTS

● MediaWiki 1.7.1; XAMPP 1.5.4.

INSIDE INFO

- MediaWiki
www.mediawiki.org
- XAMPP
www.apachefriends.org/en/xampp.html
- Comparison of different wikis
http://en.wikipedia.org/wiki/Comparison_of_wiki_software
- How to edit a page in MediaWiki
http://en.wikipedia.org/wiki/Wikipedia:How_to_edit_a_page
- MediaWiki user rights options
http://meta.wikimedia.org/wiki/Help:User_rights
- MediaWiki themes gallery
http://meta.wikimedia.org/wiki/Gallery_of_user_styles

Unless you've been hiking in the Himalayas for the past several years, chances are that you've already seen a wiki site in action. To recap, a wiki is a hypertext database that allows its contents to be edited from any web browser, often at the click of a button. Originally introduced as C2.com's "Wiki Wiki Web" (derived from the Hawaiian for "quick"), wiki-style software has since been cloned to work on a variety of platforms and enhanced with useful new features.

In this Workshop, we'll be installing and configuring MediaWiki, a freely available version of the software that runs Wikipedia.com. The goal is to end up with a customised, secure web site ready to be used by a group of people accessing it from an intranet server or via the internet. First, we'll create a couple of fresh pages to get a feel for MediaWiki's markup language. Then, we'll tweak the site's default security settings and change the wiki template.

If you don't have the necessary components to run MediaWiki, install them separately or download a ready-made package like XAMPP. XAMPP combines Apache, PHP and MySQL and can be installed under most operating systems in about ten minutes.

Once you have all of the the server components properly installed, download the MediaWiki source files and follow the standard setup instructions.

THINKING IN WIKI

After MediaWiki is up and running, you'll see the standard front page. It's not exactly breathtaking, but it is enough to get you started in developing your own wiki. Adding and

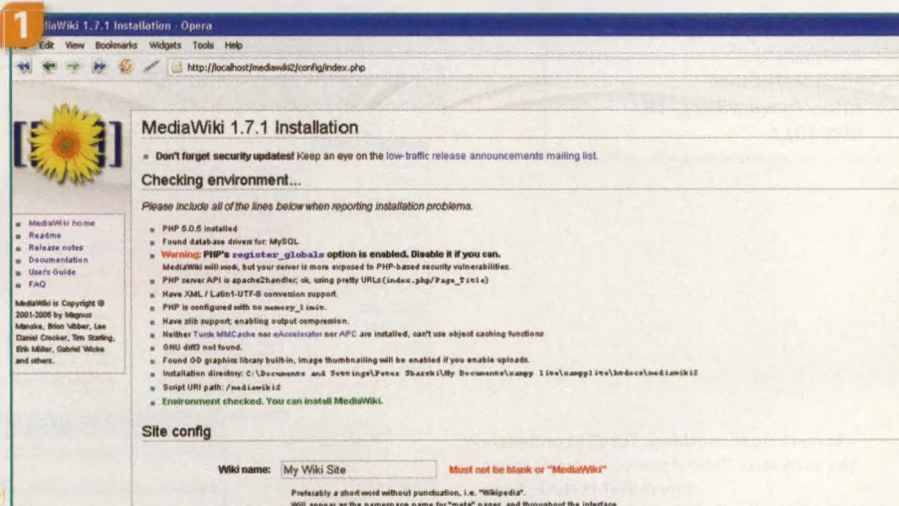
manipulating content is easy: just edit one of the existing pages, create a link to a new "wiki word" or title, then click through to the coined location and populate it.

Try this out by adding a couple of pages to your site — one for a to-do list, and the other as help for new users. Begin by clicking on MediaWiki's edit tab — a new window with a text box should appear. Any content placed in the text box will appear on the front page as soon as you save it. Skip past the existing text and on a new line type `[[To-Do List]]`. On the next line, type `[[My Tips Page]]` and click on the Save page button. You will be transported back to the main page where you will see two new links. Click on the To-Do List link first.

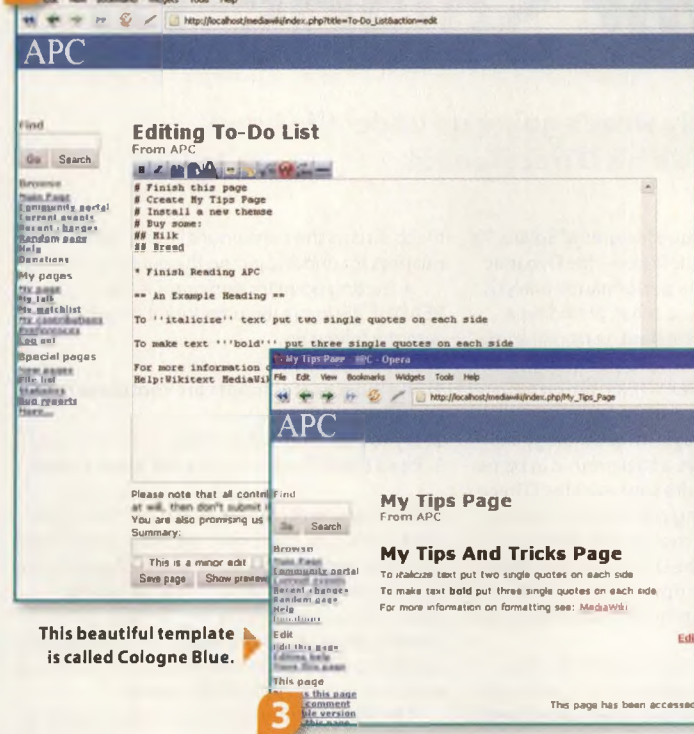
To generate a to-do list, use the inbuilt markup for ordered lists. On the first line, type the hash (#) character and then the first item in your list, for example: `# Finish this page`. On the second line, enter another entry, eg. `# Create My Tips Page`. Finally, on the third line type in your last item, eg. `# Install a new theme for MediaWiki`. Click on the Save page button. Actually — we forgot something. Click on edit and, on a new line, type `* Read APC`. This will create a separate bullet point. Save again.

To edit the second page, click on the Main Page link in the navigation panel and then click on My Tips Page. Create a headline by typing two equal signs, then the text and two more equal signs, eg. `== My Tips and Tricks Page ==`. On the next line, type `To italicize text put two single quotes on each side`. Select the word "italicize" and click on the Italics button above the text box. On the next line, type: `To make text bold put three single quotes on each side`. Select

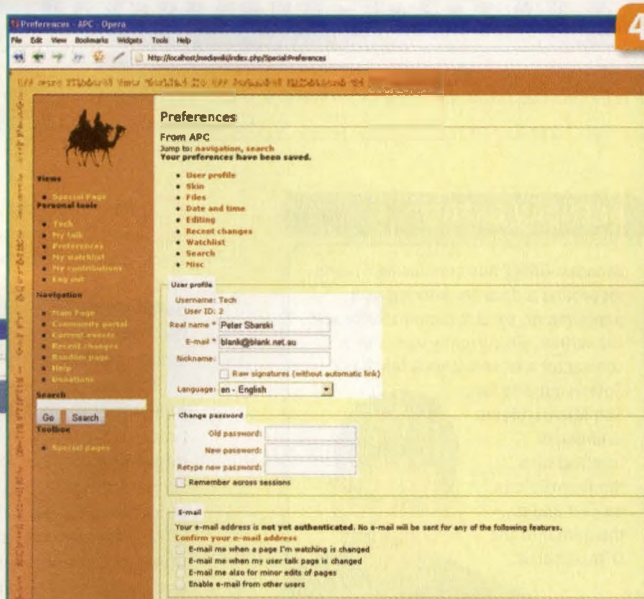
The installation procedure is straightforward. ▶



2 Editing an article in MediaWiki is a cinch.



This beautiful template is called Cologne Blue.



This Cheops skin will make your wiki a standout.

the word "bold" and click the Bold button. On the third line, type *For more information on formatting see: [http://meta.wikimedia.org/wiki/Help:Wikitext MediaWiki]*. Click on Save page to finish editing and see the result.

SETTINGS AND PERMISSIONS

MediaWiki doesn't provide a GUI for managing user rights, changing database settings or other tasks. Instead, these things are achieved by editing a configuration script called `LocalSettings.php`. By changing options in this file you can update general settings, paths, database settings, localisation, skins, access, images, extensions and more.

Security is a vital aspect to get right, especially if you want to make your wiki accessible to the internet. The first thing you should do is restrict editing to registered users. Open `LocalSettings.php`, find the line that starts with `$wgSitename` and, just below it, enter: `$wgGroupPermissions['*']['edit'] = false;`. This parameter will ensure that all users register and log in before they can edit. If you want to restrict anonymous users even further, add the following lines to `LocalSettings.php`:

```
$wgGroupPermissions['*']['read'] = false;
to disallow anonymous read access.
$wgGroupPermissions['*']['createpage'] = false;
to disallow anonymous creation of new pages.
$wgGroupPermissions['*']['createtalk'] = false;
to disallow anonymous access to discussions.
```

As a final step, if you decide to prevent people from being able to register altogether, add



YOU SHOULD TRY TO LOCK DOWN AND SECURE YOUR WIKI AS MUCH AS POSSIBLE. DEALING WITH VANDALISM IS NOT FUN

```
$wgGroupPermissions['*']['createaccount'] = false;
to LocalSettings.php.
```

Apart from changing global permission settings, you can also change rights for a specific group of users. If you trust your users to delete pages, you can grant them this right by adding `$wgGroupPermissions['user']['delete'] = true;` to `LocalSettings.php`. On the other hand, if you only want to allow SysOps to do it, use `$wgGroupPermissions['sysop']['delete'] = true.`

Some other rights that you can grant or deny include: undelete, protect, block, upload, rollback, patrol and move. Naturally, you should try to lock down and secure your wiki as much as possible. Dealing with vandalism is not fun.

THEMES

By default, MediaWiki comes with seven skins. To change to a different skin, log into your account and click on preferences. Then, select Skin and pick a new template. You can preview any one by clicking on the preview link next to it. Once you are happy with your choice, click Save.

As an admin, you can also add new skins. Go to the MediaWiki styles gallery (see Inside Info) and select a new theme. The installation process can be a bit convoluted, so, for this exercise, we recommend a basic skin like Cheops. Copy its CSS to a file called `Cheops.css`, then open the

skins folder located in the main MediaWiki directory. Duplicate the folder called "monobook" and name it **Cheops**. Then, make a copy of `MonoBook.php` and call it **Cheops.php**.

Open `Cheops.php` in a text editor and find the line which says "class SkinMonoBook extends SkinTemplate". Change "SkinMonoBook" to **SkinCheops**. Just below it, change "skinname" and "stylename" from "monobook" to **Cheops** and change "MonoBookTemplate" to **CheopsTemplate**. Next, find "MonoBookTemplate" and swap it to **CheopsTemplate**, and finally change "MonoBookTemplateToolboxEnd" to **CheopsTemplateToolboxEnd**. Save and close the file.

Inside the Cheops folder, rename the file `main.css` to `main-backup.css`. Copy `Cheops.css` to this folder and rename it to `main.css`. Go back to your wiki and look in skin preferences. Select Cheops and hit save. If you don't immediately see the new skin, hit the reload button to refresh your browser. If you want Cheops to be the default skin for all users, open `LocalSettings.php` and find `$wgDefaultSkin = 'monobook';`. Change "monobook" to **Cheops** and don't forget to save again.

For further information and help on MediaWiki, check out www.mediawiki.org/ and <http://meta.wikimedia.org/>.



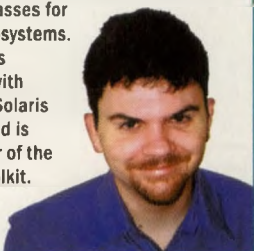
DTraceToolkit for Solaris 10

Performance analysis helps you figure out exactly what's going on under the hood.

Brendan Gregg measures Solaris performance with his DTraceToolkit.

BRENDAN GREGG

Brendan Gregg has been using Solaris for around a decade, working as a programmer, system administrator and consultant. He currently works as a contractor and sometimes teaches Solaris classes for Sun Microsystems. Brendan is involved with the OpenSolaris project and is the author of the DTraceToolkit.



SKILL LEVEL

Advanced

TIME TO COMPLETE

Two hours (approx.)

REQUIREMENTS

Solaris 10

One of the most unique features of Solaris 10 and OpenSolaris is DTrace — the Dynamic Tracing facility. DTrace is a performance-analysis and debugging tool like no other, providing a detailed insight into the beating heart of the OS, the kernel. It also provides a programming language to write complex scripts, similar to C.

In theory, DTrace is one of the greatest milestones in operating system technology. In practice, we don't all have a background in kernel internals to be able to write sophisticated DTrace scripts from scratch. Using pre-written scripts to automate analysis is the most practical use of DTrace for many of us. The DTraceToolkit provides numerous pre-written scripts that are easy to use and ready to run — and provides documentation to explain their usage.

The DTraceToolkit is introduced here, along with some of the most useful scripts it contains. It is available for free from www.opensolaris.org/os/community/dtrace/dtracetoolkit or www.brendangregg.com/dtrace.html and runs on OpenSolaris or Solaris 10.

DTRACETOOLKIT

In 2005 I released the first version of the DTraceToolkit as a collection of useful DTrace scripts I had been writing over the previous year. It has quickly become a popular freeware download and is gaining widespread use on sites with Solaris 10. It also features in the recently released Solaris Internals second edition, to solve problems that previously were very difficult or impossible. The toolkit now has a handful of contributors and around 100 scripts.

The DTraceToolkit is currently three parts: the scripts, the man pages and the example files. Every script has a man page and an example file for usage demonstrations. Some have a "notes"

file to discuss the behaviour of the script or nuances for understanding the output.

A starting point for beginners is the README file in the top directory. It begins with the following:

1. The most useful scripts are contained in the top directory.
2. Try to run them with `-h` (eg. `./execsnoop -h`).
3. Read Docs/Contents for a full list of scripts.

Rather than simply dumping around 100 scripts right in your lap, the toolkit has a hierarchy so that the most useful scripts are able to be found in the top directory and all of the other scripts are located (logically) in other meaningful subdirectories, eg. Disks. A Bin directory exists to symlink to all scripts in one location. This can be a useful addition to your PATH variable.

The README file then lists a table of contents by listing directories and files that can be found in the toolkit. The following are highlights:

Dir/File	Contents
Bin	Symlinks to scripts
Apps	Application specific scripts
CPU	CPU analysis scripts
Disk	Disk analysis scripts
Docs	Documentation
Docs/Contents	Command list
Docs/Examples	Example files
Docs/Faq	FAQ
Man	Man pages
Mem	Memory analysis scripts

In this example output of `execsnoop`, a `man ls` command can be observed.

```

~/DTrace/DTraceToolkit-0.92# ./execsnoop
  UID  PID  PPID  ARGS
  0    25079  24900  man ls
  0    25080  25079  sh -c cd /usr/man; tbl /usr/man/man1/ls.1 |neqn /usr/share/l
ib/pub/eqnchar - |n
  0    25082  25081  tbl /usr/man/man1/ls.1
  0    25083  25081  neqn /usr/share/lib/pub/eqnchar -
  0    25084  25081  nroff -u0 -Tlp -man -
  0    25081  25080  col -x
  0    25085  25079  sh -c trap '' 1 15; /usr/bin/mv -f /tmp/mpxFa4.W /usr/man/ca
t1/ls.1 2> /dev/nul
  0    25086  25085  /usr/bin/mv -f /tmp/mpxFa4.W /usr/man/cat1/ls.1
  0    25087  25079  sh -c more -s /tmp/mpxFa4.W
  0    25088  25087  more -s /tmp/mpxFa4.W
  
```



```

Terminal
File Edit View Terminal Tabs Help
~/DTrace/DTraceToolkit-0.92# ./iosnoop
  UID  PID  D   BLOCK  SIZE  COMM  PATHNAME
    0  25181 R   3570112 3072   grep  /var/adm/messages.0
    0  25181 R   423134  1024   grep  /var/adm/messages.1
    0  25181 R   6714416 2048   grep  /var/adm/messages.2
    0  25182 R    78304  8192   bash  /usr/bin/ls
    0  25182 R    78320  3072   bash  /usr/bin/ls

```

In this example output, several disk events with useful details can be seen.

Net	Network analysis scripts
Proc	General process analysis

What can't be seen in the toolkit is the effort that has gone into testing. Often, writing the script is the easy part — testing that a script works can consume much more time.

INSTALLATION

The DTraceToolkit is currently distributed as a gzipped TAR file. Unpack it using: `gzcat DTraceToolkit*.gz | tar xvf`. This will create a subdirectory containing the toolkit and all of the scripts that you'll need.

The scripts and example documentation can be used immediately after unpacking — it is not necessary to run through the installer. The installer has been written for those who really want one. Run `./install` in the toolkit directory and follow the prompts. It installs into `/opt/DTT`.

ONE-LINERS

The DTraceToolkit contains a list of DTrace one-liners — useful commands that can be typed without exceeding 80 characters. They can be found in the toolkit in the `Docs/oneliners.txt` file and have a few key advantages:

1. They provide simple solutions to common problems.
2. They help when learning the DTrace language by providing small easy examples.
3. As they aren't scripts, it is possible that they can be used in some environments where scripts would normally require a lengthy approval procedure, and commands do not.

The third advantage is interesting and a reflection of the role Solaris plays in the real world. There are many high-end servers running Solaris in critical environments (for example, banking) where the administrators must be extremely cautious about

any additional software that is added to the systems. A script from the DTraceToolkit may need to be studied first for approval, perhaps taking weeks; however a simple one-liner may be studied and approved in little time.

As an example of a DTrace one-liner, the following traces system calls by process name, producing a report to identify which process caused the most system calls: `dtrace -n 'syscall:::entry { @num[execname] = count(); }'`.

The script will begin tracing after it has been executed, and prints a report when Ctrl+C is hit.

SCRIPTS

There are two types of scripts in the DTraceToolkit: either pure DTrace scripts or Perl/shell-wrapped scripts. Pure DTrace scripts end in `.d`, for example `bitesize.d`, and are written entirely in the D programming language — the language that DTrace uses (which is similar to C). D is very capable, however, there are a few limitations, in particular the ability to process command-line options (known as "getopts" in other languages). For that reason, many scripts have been wrapped in shell or Perl to use their `getopts` function, before handing processed arguments to DTrace. These scripts don't end in `.d` and can be run with a `-h` option to list usage.

The scripts in the DTraceToolkit have been written in a readable and annotated style. At the top of each script are comments to describe its purpose and usage, information which also exists in the man pages provided. See the `Docs/Contents` file for a description of all the scripts.

TOP-LEVEL SCRIPTS

The following are the first few scripts to run when taking a look at a poorly performing system. This assumes you have already checked the basics, such as CPU, memory, disk and network — which were introduced in the Revving up Solaris

Workshop (APC April, page 124). These six scripts are particularly useful as they analyse areas of the system previously difficult or impossible to see:

Script	Description
execsnoop	Trace process creation
iosnoop	Trace disk events
opensnoop	Trace file opens
errinfo	View syscall errors
Disks/bitesize.d	Analyse disk access size
procsystime	Analyse syscall times
rwtop	Application I/O

The following sections describe three of these scripts and provide an example.

EXECSNOOP

The `execsnoop` script traces the execution of new processes with argument details. Standard process status tools examine snapshots of the system; for example, the `prstat` command examines the currently running processes every five seconds. That frequency is usually fine, however, sometimes short-lived processes can appear and then disappear in-between the sampling intervals — and hence be invisible to such status tools. These fleeting processes can cause performance headaches, which have been difficult to identify in the past without tools such as `execsnoop`.

1 In this example output of `execsnoop`, a `man` command can be observed. It may already be known that the `man` command runs the `more` command to read the man page, but the output is much more surprising — showing that several other commands were also executed. These extra commands compile the man page for viewing.

It is interesting to leave `execsnoop` running on a system for a while, to see if any unexpected commands are occurring. Run `execsnoop -h` to see other options, which includes `-v` to include printing a time field.



WE DON'T ALL HAVE A BACKGROUND
IN KERNEL INTERNALS SO THAT WE CAN
WRITE SOPHISTICATED DTRACE SCRIPTS



3

```

~/DTrace/DTraceToolkit-0.92# ./Disk/bitesize.d
Sampling... Hit Ctrl-C to end.
^C

  PID  CMD
 25215  find / -ls\0

      value ----- Distribution ----- count
      512 |
      1024 | @@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@ 126
      2048 | @@
      4096 |
      8192 | @@@
      16384 |
      0

25214  dd if=/dev/rdisk/c0d0s0 of=/dev/null bs=128k count=100\0

      value ----- Distribution ----- count
      65536 |
      131072 | @@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@ 100
      262144 |
      0

```

In this sample, bitesize.d shows that a find command caused many small disk events.

three lines show a grep command reading the messages files from /var/adm, followed by bash reading the /usr/bin/ls file (no doubt to run it).

BITESIZE

The bitesize.d script produces a report, rather than the previous two scripts which print events. The report contains frequency distributions of disk event sizes by process. This can help identify if a process is using the disks in a poor manner — by many small disk events (or bites), rather than large events (which usually perform better).

In this sample, bitesize.d shows that a find command caused many small disk events, 126 of them in the one to 2KB range; and the dd command caused many large disk events, 100 of them in the 128 to 256KB range.

FURTHER INFO

For the remaining scripts, see the Docs/Contents in the toolkit for a table of contents, and see the Docs/Examples directory for commented examples. While the toolkit contains around 100 scripts to examine a wide range of system behaviour, it is likely that most users of the toolkit will use fewer than 10. Some people have even found all they need in the list of one-liners! [ETC](#)

IOSNOOP

A long-term shortcoming with disk performance monitoring was the lack of an easy way to associate disk activity with a process. The iosnoop script does this with ease, printing details for every disk event as it happens. It fetches its information from the block I/O driver, so what

you are seeing are I/O events that have made it to disk (and not those that have been cached).

In this example output, several disk events with useful details can be seen. Such disk events could be the PID, direction, disk slice BLOCK address, SIZE, responsible COMMAND, and PATHNAME (if available) can be seen. The first

Get your
apc
Daily!
The new apcmag.com



APC magazine now has a new website with original daily content not found in the magazine. We bring you the latest on technologies such as PC systems and hardware, OSes and applications, the internet and games.

A better buddy icon

Picture perfect? *Patrick Kirsch* retouches a digital photo to give it that magazine-friendly look — and explains how to do so.

PATRICK KIRSCH

Patrick Kirsch, former designer of APC, has worked in digital media and design for more than 15 years. He has extensive experience on computers, ranging from animating on Amiga, to video post-production, print, web and multimedia. Patrick is also a musician and a home cinema buff — just don't get him started on movies.



SKILL LEVEL

● Beginner

TIME TO COMPLETE

● One hour

REQUIREMENTS

● Photoshop 7 (and above)

Whether you're playing around with family photos or putting together a better-than-honest MySpace profile, retouching faces can be a fun and satisfying way to explore Photoshop's capabilities at home. Using a trio of tools (Healing Brush, Clone Stamp and Patch), virtually anybody's image can be buffed up, smoothed out and made into a digital work of art.

Let's go through the process of enhancing a standard photo. To start, visually identify any spots or bumps you want to get rid of. Duplicate the main photo layer, so you have the option to backtrack later, and choose the Healing Brush "band-aid" from the Toolbox. Select a hard-edged brush that is just larger than the average size of the spots. (The Healing tool automatically blurs its edge, so a soft brush is unnecessary.) Also, on the option bar, make sure that Mode is set to Normal and Source is set to Sampled.

SMOOTH MOVES

Next you can work on the longer wrinkles. Choose a sample point with the appropriate texture for the wrinkle you are healing and paint in short strokes, releasing the mouse button each time so that Photoshop can update the image. If Aligned is unchecked in the option bar, every release of the mouse will return the sample point to its original location. This can be helpful if you have a large area to heal using only a small "perfect" sample.

When painting close to a high-contrast edge, such as a jaw line, the Healing Brush will often smear instead of giving a clean result. In such cases, the Clone Stamp tool is a better choice because it copies exactly, rather than processing and blending the surrounding pixels. Just keep in mind that this extra precision means a more careful selection of sample point is necessary.



THESE ARE ALL THE TECHNIQUES YOU SHOULD NEED FOR MOST JOBS; HOWEVER, IT'S EASY TO GO OVERBOARD

Hold down the Alt key, and click on an area nearby the spot you wish to conceal. Then, release the Alt key and click on the spot itself. The Healing brush takes the texture of the sample point and applies it, using a complex algorithm, to the colour and luminosity of the area you are healing. ❶ Continue to go around the face and neck repeating this process to remove the most obvious blemishes.

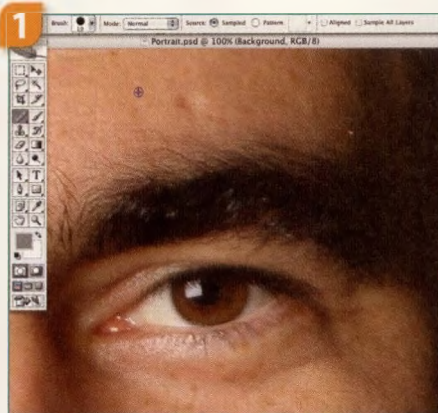
To clone an area, select the Clone Stamp "rubber-stamp" tool and, with a fairly small, soft-edged brush, Alt-click a spot with the texture, colour and luminosity you need. Sometimes this is a selection right on the edge you are repairing, followed by careful painting on the same spot further along the edge. Another thing that can benefit from cloning is the removal of stray hair.

PATCH IT UP

The Patch tool works in a very similar way to the Healing tool, but is better suited to larger areas. Good candidates for this in the example shown would be the indentations in the forehead and the area under each eye.

Select the Patch tool by clicking and holding on the Healing Brush icon (until the fly-out menu appears) and click the Source radio button on the option bar before proceeding. The Patch tool requires you to make a lasso selection around the area you wish to repair. Once you have drawn the selection, drag it to a location with the desired texture and the source area will be given that texture. Alternatively, if Destination is checked on the option bar, select the texture you want first and then drag it to the target area.

These are all the techniques you should need for most jobs; however, it's easy to go overboard. If you find that any of the work you've done looks too unreal, use a Layer Mask to partially reveal the original image. **FILE**



Before and after: no mucking about with scalpels here — all the surgery is digital.





apc downtime

HIGH-PERFORMANCE PLAYTIME

GEAR

BOOKS

GAMES

CHIP CH



RSS and Atom in Action

You know you're dealing with geekified web programming when there's a picture of some type of monk on the cover wearing a sword and sandals. Is this how coders imagine RSS, like the simple-yet-noble zen master of web syndication feeds? The authors say this stuff could "change the world" so, if you're making web sites, it might be handy to know. There's a lot of talk about blogging here, but don't let that put you off if you're sick of hearing about them. This is solid stuff about newsfeeds and protocols that web developers might find handy.

.. CONTACT Manning
.. ISBN 1932394494
.. PRICE \$69.99

.. VERDICT ★★★★★☆

USB MP3 Pen

You can talk into this pen, put MP3s on it and listen to FM radio. You will also most probably irreparably damage your chances of getting a girlfriend if seen doing any of the above in public, though we'll leave that decision up to you. Like the twig (see right), the pen is Linux, Windows and Mac-compatible and has 512MB (or 1GB) capacity, weighing in at 50g. The pen also has what the creators describe as "electromagnetic wave protection". In terms of geek appeal, this rivals those multifunction Casio wristwatches from the late 80s — and you can still do maths with it.

.. CONTACT usb.brandoo.com.hk
.. ONLINE <http://usb.brandoo.com.hk/>
.. PRICE From US\$48 (512MB)

.. VERDICT ★★★★★☆

mobiBLU "Cube2"

Well, at least someone's trying to stand out from the crowd. This 1in cube is supposedly the world's "smallest digital audio player" — an impressive claim, though, we can't say we've tested that theory (there are some pretty small flash memory players). The Cube2 people reckon this thing is snazzy enough to wear around your neck. We reckon that's not going far enough: why not just clip 'em on and use them as earrings? Fashionable *and* functional! Capacity is 1GB and there's also an FM radio, voice recording and alarm function. Plus, it's got a funky OLED colour screen.

.. CONTACT Anywhere
.. ONLINE www.mobiblu.com
.. PRICE \$199

.. VERDICT ★★★★★☆

Topfield TF6000PVRt WLAN PVR

The capabilities of these digital set-top boxes are starting to get confusing if you're not in the know — Wi-Fi PVR with EPG, SD and 200GB HDDF anyone? For PVR buffs (digital TV recorder with hard drive), the exciting thing here is Wi-Fi, which gives you the possibility of hooking up to your PC for updated electronic TV program guides. This unit is pretty expensive, but if you've got the dough you'll be at the forefront of a whole new revolution in TV and internet convergence (or something). Well, it's better than Borat's VCR anyway. Get it? Got it? Good.

.. CONTACT Topfield
.. ONLINE www.topfield-australia.com.au
.. PRICE \$1,249

.. VERDICT ★★★★★☆

ABC
UBER

Super cool

ABC
1337

Very cool

ABC
7006

Uncool



Sony Walkman DVE7000S Portable DVD Player

Do you want to watch movies on the road but don't want to have to fork out for a \$3,000 notebook to do it? At 7in, this portable DVD player from Sony doesn't have the same screen size, but it'll do the trick for car trips, plane flights or just general commuting. Battery life is rated for three hours of video, or you can plug it into a car for powering. The good thing is the price: not particularly cheap, but keep in mind that, once upon a time, portable players like this used to cost well over \$1,000. Also, it's handy for music if you don't already have a music player.

Oooms USB memory sticks

Some guy has gone out into the woods in the Netherlands and collected little sticks, stuck holes in them, wedged in USB keys and now here they are. The little sticks are fine for Windows, Linux and Mac, and definitely make people look twice when wedged out the end of a fancy notebook or desktop PC. Capacity goes up to 1GB and they cost about \$70 (for the wood?). Plus, the web site takes orders. We love the idea of carrying around hundreds of music files on a twig — just don't drop it in the park. Our verdict? Straight to the pool room.

KCE-422i — iPod Full-Speed Cable

The looks of a modded Honda CRX are easily spoiled by a clunky audio break-out box connecting your iPod to your stereo — self-respecting car nuts should invest in this cable, which connects your iPod to a "Full Speed"-compatible stereo head unit (ie. Alpine head units). What's the point? With a compatible Alpine head unit and this magical black cable, you can control the music from your stereo instead of fiddling with the iPod touchpad. Four Alpine units also have a "percentage search" feature, which breaks up your huge music collection into manageable chunks.

Sony Ericsson HPM-82 headset

For \$60-odd dollars you better be getting a quality headset. These puppies are Walkman-branded and designed to give you quality stereo music listening on a mobile phone. The remote control has a 3.5mm plug which apparently is so you can switch between different earphones but, honestly, how many do they expect us to own? If you've got a fancy music-capable phone, then a remote like this is handy because you can control the music and handle calls while the phone is in your pocket. What's that? You don't have a music-capable phone? Get with the program.

..: CONTACT Sony
..: ONLINE www.sony.com.au
..: PRICE \$429

..: VERDICT ★★★★★

..: CONTACT Oooms
..: ONLINE www.oooms.nl
..: PRICE \$70

..: VERDICT ★★★★★

..: CONTACT Apple
..: ONLINE www.apple.com.au
..: PRICE \$69

..: VERDICT ★★★★★

..: CONTACT Sony Ericsson
..: ONLINE www.sonyericsson.com.au
..: PRICE \$61

..: VERDICT ★★★★★



Company of Heroes

John Gillyooly hunkers down in a foxhole and rides out the war.



CONTACT THQ
ONLINE www.companyofheroesgame.com
PRICE \$89.95

✓ Immersive and beautiful.

✗ Fast pace takes some getting used to.

VERDICT ★★★★★

Relic Entertainment has been in the RTS game for a long time and has always done its utmost to advance the genre. *Homeworld*, *Impossible Creatures* and *Dawn of War* were all uniquely compelling experiences, and *Company of Heroes* is perhaps the finest game Relic has made to date.

By all rights this game should be a moderately entertaining but highly derivative experience. It is set from D-Day onwards in WWII, with you following the path of Able Company across Europe. The experience is up close and personal, with a highly fluid feel thanks to the capture-and-hold nature of the maps.

In the game your base is seldom more than a staging point, with the front lines in a state of flux. You need to capture points on the map that in turn give a supply of resources, but only if the sector is connected to your base. This means that maintaining supply lines becomes as important as pushing towards your ultimate goals.

This is achieved through a relatively small number of units, empowered with enough AI to keep the game from becoming a hot-keyed micro-management nightmare. Units can fortify buildings, be assigned fields of fire and generally hold their own against insurgence (while you are busy taking a point on the other side of the map), yet an



"I'm not sure if it's the blast impact or the Red Bull, but I'm flying!"

overall awareness of what's going on is still needed to react to the more devious moves of the enemy AI.

However, *Company of Heroes* steps beyond this solid gameplay foundation and uses both graphics and physics to make the experience immediate and immersive. Tanks come crashing through walls, satchel charges cause buildings to realistically crumble and artillery barrages are imbued with an awe-inspiring savagery as they tear up the landscape.

It's rare that we've seen physics used to such an extent, and while the effects are for the most part cosmetic, they provide excellent feedback as to what's happening. You can see when the building you're holed up in is starting to come apart, even without looking at health bars. Or you know instantly the sort of high-explosive weapon pounding your position (based on impacts).

Those who like a sedate pace in their real-time strategy will



probably struggle with *Company of Heroes*. But once you get your head around the need for mobility, it becomes a very fluid experience. However, you still get time to think, thanks to the unit AI. Units are smart enough to keep advancing on a position when they can (or to take cover when fire is too heavy). You can easily set down covering fire while you control a flanking group, for example.

Company of Heroes is a blast of fresh air in the RTS genre and a great example of cutting-edge technology and gameplay. Be it working through the single-player campaign or going head-to-head with your mates, there are hours of fun to be had.





Flight Simulator X

Tony Sarno and Flight Simulator X reach new levels of realism.

Flight Simulator has been around since 1980, so it's always been a perfect mirror of the power of computers of the day. When Microsoft purchased it and released it as Microsoft Flight Simulator 1 for the IBM PC in 1982, you got the kind of realism that an 8086 chip could generate — one that was pretty good in approximating the mechanics of flight, but which generated cartoonish looking planes that you generally crashed into solid fluorescent green colour landscapes.

In the early Microsoft Flight Simulators, you pretended you were flying. When the realism got quite good in Flight Sim 2004 (at the tail-end of the Pentium era), you could almost imagine what a real flight was like. With Flight Simulator X (FSX) and the era of dual-core CPUs — and monster GPUs — you don't have to pretend anymore.

FSX on a powerful gaming machine is pretty close to a real-life

3D simulation of flying. The aluminium shines and aircraft liveries change shade in relation to the angle of the sun. You can see the wear in cockpit surfaces and seats. And if you overfly a city (see Melbourne CBD, left above) or land on a harbour (Opera House, right) you get Google Earth-style resolution of the streets or surroundings. Admittedly, outside the cities you start to get generic terrain textures, but the contours and major physical shapes of the landscape are spot on.

FSX's flight realism is also the major caveat for this game. You need a top-of-the-line machine to fully appreciate it. We ran Flight Sim X on an AMD Athlon 64 X2

dual-core machine with 2GB of RAM and a GeForce 7800 GT, running Vista Release Candidate 2, the kind of system and OS for which it's optimised. With the realism levels turned right up, the resulting experience was nothing short of breathtaking. But others who've run FSX on average machines report problems with slow frame rates.

FSX works on many levels. At the most basic, you can pilot a plane to any of its 24,000 airports and have a great time enjoying the scenery on the way. Just feed the throttle, pull back the joystick and you're off. Or, if you're a professional pilot, you can practise checking in flight plans, chatting

with the tower and flying long distance routes. Or, if you want games, FSX introduces structured gameplay, with up to 55 missions featuring point-to-point objectives and testing of flying skills.

The Deluxe version of FSX has more missions and planes, plus more realistic airports and cities (and an advanced Garmin cockpit).



CONTACT Microsoft
ONLINE www.microsoft.com.au
PRICE \$119.95 (Deluxe version)

✓ 3D realism; missions.

✗ Needs powerful PC.

VERDICT ★★★★★



ape owntime

Jaws Unleashed

HIGH-PERFORMANCE PLAYTIME

GEAR / BOOKS / GAMES / CHIP CHAT

Dan Chiappini ponders whether it's possible to "jump the shark" when you're playing as one.

Pick up just about any video game from the last twenty years and one commonality becomes glaringly obvious — there's always a "bad guy". Infiltrate and destroy the terrorist cell holding the government to ransom with a stolen nuclear warhead; hack and slash your way through 40 levels to free the princess; and return the stolen magic bell of awesome to its owner.

So, it was a nice change to turn the tables and see you play one of the most infamous non-human "bad guys" ever to grace movie screens.

Jaws Unleashed puts you right in the action, roaming the expansive ocean floors in search of food and adventure (and more food).

Unfortunately, the concept is a lot better on paper than the actual game experience, which sees you re-enacting themes from the movie series but wrestling with the controls and camera system while you complete side quests.

We admire developer Appaloosa's ability to not only breathe new life into the dead-in-the-water Ecco the Dolphin series but take it from mild-mannered mammal to a voracious eating machine, devouring beach-partygoers, head-butting jet-ski riders and chewing anything that gets in your way.

That's not to say Jaws doesn't have a social conscience: side-quests include destroying the local toxic

refinery and culling dangerously overpopulated white seals as they lounge about in the surf. (Those slimy, lazy bastards!)

Completing quests gives you points that can be spent on upgrading abilities like accuracy, power and health. Unfortunately, it's a very obvious console port: the keys can't be remapped and the mouse sensitivity will have you either scrolling endlessly or losing your lunch as you swish around the sea.

Hidden extras scattered throughout the game unlock classic Jaws movie footage, while the load screens tell you everything you didn't know — and probably didn't care enough to ask — about the film's original theatrical release.

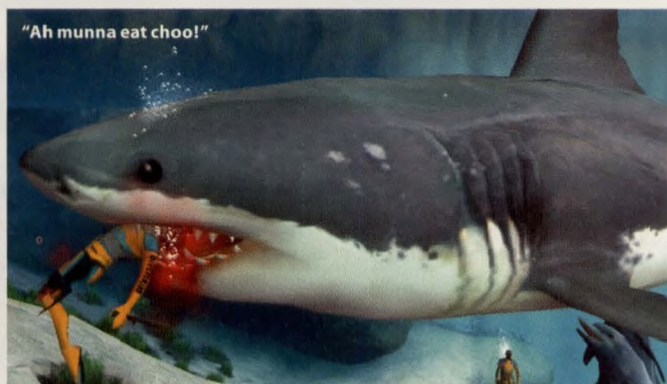
With all its faults, it's still a fun frolic in the surf — but even in its irony, we draw the line at having to find an access key to open a security door as a shark.

CONTACT THQ
ONLINE www.jawsthegame.com
PRICE \$49.95

✓ Be the shark; eat everything in sight.

✗ Dodgy camera and control system.

VERDICT ★★★★★



Pro Evolution Soccer 6

You liike-a tha soccer, yah? Is niiaaice. Willam Maher dons his shin-pads.

Soccer games like this must be to first-person-shooter fans what Nickelback is to keeping-it-real music fans — fun, but too commercial to admit to in public.

Don't fight what you can't deny, I say. Sure, you can spend many hours playing Battlefield 2142, but there's also something satisfying about a quick run around the park booting the bejesus out of a soccer ball.

What I've always loved about Pro Evo is it is simple to pick up and play, but a challenge to master.

This latest version introduces even more tricks and moves, including backwards dribbling and cool, little snap shots. The controls are also better too — Pro Evo diehards will notice that there's much more control over how you can head the ball.

Watching your players shoot crazy goals is a joy — the players movements look really, really good, especially in slow motion. My suggestion is developer Konami overlays Linkin Park (or something similar) on these

replays — you'll have a zillion fan vids on YouTube, no worries. There's already a few there now.

Konami's even picked up on a pet annoyance from previous versions and now lets you take quick free kicks. The refereeing has also been made more lenient, which seems like a weird way to go, until you read interviews with the game's creators, who say too many people got put off by low scorelines. I do a lot of sliding tackles, so I'm not going to complain if the ref's less hasty to blow the whistle.

Overall, the classic look and feel of the Pro Evo series is still there. Konami claims this is a complete redesign, but to me it's more like some quality enhancements. One thing: the PC version is still a console port, so once they fix up the menus and screen resolution, this'll be really unbeatable.

CONTACT Atari
ONLINE www.Atari.com.au
PRICE \$89.95

✓ New moves; great replays.

✗ Console menu screens.

VERDICT ★★★★★



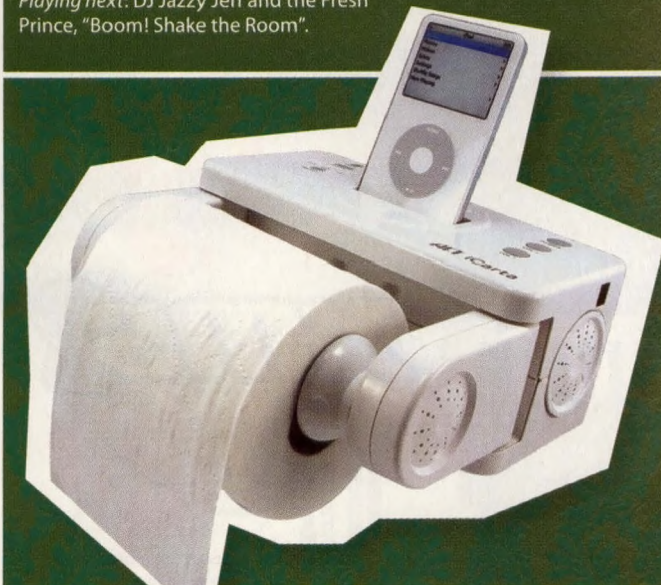
Rock 'n roll!

Ecosystems: they're all around us. Wikipedia defines the term to mean a "collection of components and processes that comprise and govern the behaviour of some defined subset of the biosphere." Now, pretty much anything can be considered a subset. Take the iPod, for example. Apple's success with the ubiquitous music player has given rise to what is often called the "iPod ecosystem" — an astounding array of add-ons and accessories designed to complement (and exploit the market strength of) the iconic device.

However, an ecosystem can fail when it is *out of balance* — when new species or influences are introduced that threaten its natural state of equilibrium. This brings us, ultimately, to the "iCarta Stereo Dock for iPod with Bath Tissue Holder". It does exactly what you think it does. (And features moisture-resistant speakers.)

Now, some of you might say that this sort of thing was inevitable; that we were always heading in this direction. But what does the iCarta really represent? The next step in natural selection, or merely *An Inconvenient Truth*? Either way folks, the iPod ecosystem is now officially at risk — of absurdity. Anyway, that's one way of looking at it. An alternative could be that it's just another crap accessory.

Playing next: DJ Jazzy Jeff and the Fresh Prince, "Boom! Shake the Room".



OK — this one has to take some sort of award for weirdest press release from a major corporation. Optus recently announced the launch of its new 3G "internet on your mobile" advertising campaign, which is designed to create customer awareness of Optus 3G services. How so? Well:

"The ads contrast the peaceful, natural world of animals and their slightly bemused attitude as they interact with humans in everyday situations. The ads show that chaos and panic could have been avoided had the animals used Optus mobile content. For example: a tiger attempts to read the newspaper over someone's shoulder at a bus stop — this scares the commuter. To avoid this mayhem, the tiger could have used his Optus 3G mobile phone to view the news live on ABC News."

Of course — a logical conclusion for the tiger to have made! "MyZooNow gives a level of personalisation not seen before in the market," said Warren Hardy, managing director for Optus Consumer. "We are confident that customers that have not yet made the switch to Optus 3G will see our new campaign and consider making the move." Uh, yeah, sure. We're talking about people here, right?

"A" for effort

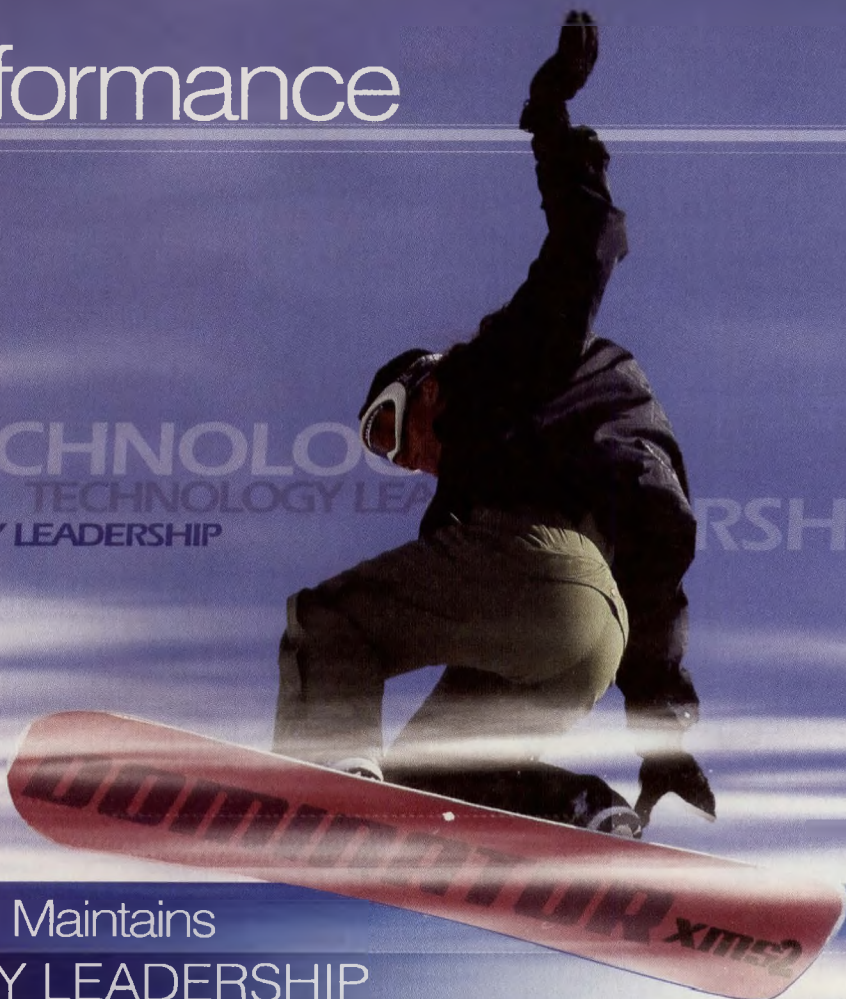
It's one of the most famous phrases ever spoken in the English language — the words Neil Armstrong said as he exited the Apollo 11's "Eagle" lunar module and touched down on the Moon's surface on 21 July 1969: "That's one small step for [a] man, one giant leap for mankind." As reported by the *Houston Chronicle* (www.chron.com), the non-grammatical omission of the "a" in the speech has long provoked debate among historians, academics and scientists — that is, until now. Australian-based computer programmer Peter Shann Ford recently used high-tech sound software to analyse the transmission and has proven that Armstrong did in fact say the "a", although the utterance only lasted 35 milliseconds (too short for humans to hear). A vindicated Armstrong (who always claimed that he did say the "a") called Ford's analysis "persuasive". Final score: Armstrong, one; haters, zero. **ETC**



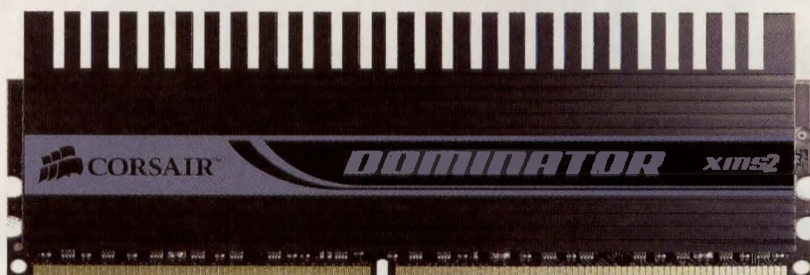
cool performance



TECHNOLOGY
TECHNOLOGY LEADERSHIP
TECHNOLOGY LEADERSHIP



How CORSAIR Maintains TECHNOLOGY LEADERSHIP



XMS2



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PERFORMANCE
RELIABILITY

Protect Components While You Push Performance

Pushing performance specs generates heat, and that can compromise reliability and component life. The advanced cooling ability of DHX heat sinks keeps your memory safe and reliable even as you push it to the limit. Under the name XMS2 Dominator, this DHX technology will be showing up on both Corsair parts designed for extreme overclocking and on memory designed for performance computing and gaming.

Also Featuring Enhanced Performance Profiles (EPP)

As with all new Corsair performance memory, XMS2 Dominator modules feature EPP, the new open standard for the Serial Presence Detect (SPD) jointly developed by NVIDIA and Corsair. EPP simplifies overclocking for beginners and provides unparalleled control for experts.



An optional fan (not shown) provides even more cooling and protection.



Corsair's proprietary DHX technology dissipates heat two ways: it draws heat away from the module through the RAMs and provides an additional path for heat transfer within the module through the ground plane!



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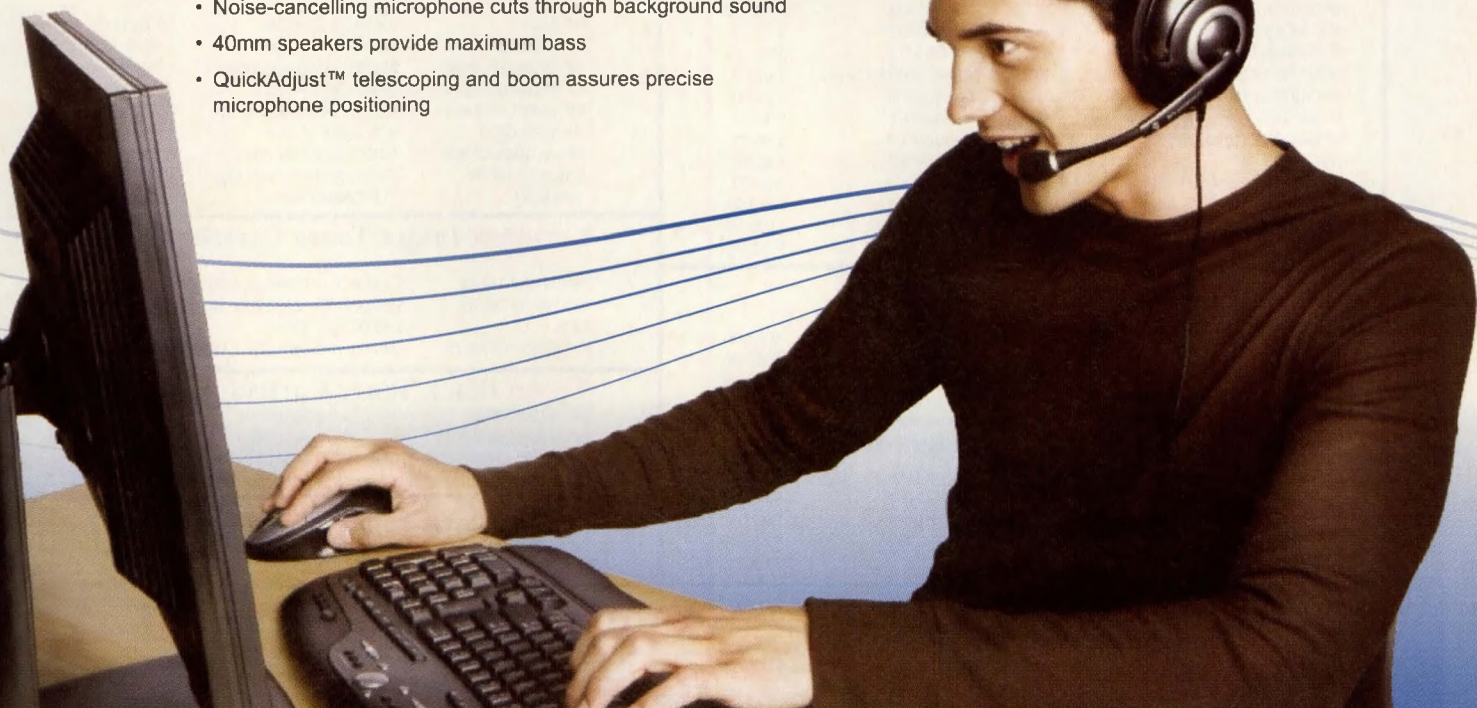
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TN-8000	\$ 22.00	DR3000 (Drum)	\$105.00
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Samsung Inkjet/Toner Cartridges-Rem:

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ML-2250	\$ 90.00	ML-4500D	\$ 75.00
ML-5200	\$ 80.00	SF-5100D	\$ 65.00
Ink- M40 (SF-330/331/335/341)	\$ 35.00		

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HP 2550	(Q3960A-Q3963A)	\$100/\$110 ea
HP 8500/8550	(C4149A-C4152A)	\$ 90/\$150 ea
HP 4500/LBP-2040	(C4191A-C4194A)/EP-83	\$ 70/\$85 ea
HP 4500/LBP-2040	Drum Unit C4195A	\$120.00 ea
HP 2500/LBP-2410	(C9700A-C9703A)/EP-87	\$ 80/\$95 ea
HP 4600/4650	(C9720A-C9723A)	\$150/\$180 ea
Epson C900/C1900	(S050100/97/98/99)	\$ 95/\$115 ea
Epson C1100/N	(S050190/187/188/189)	\$ 98/\$130 ea
Samsung	CLP-500B/C/M/Y	\$120 ea

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Epson Black Toner Cartridges-Rem:

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EPL-6200	S050166	\$ 70.00

Panasonic Black Toner Cartridges-Rem:

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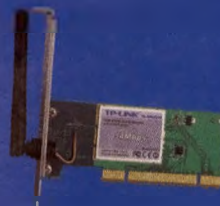
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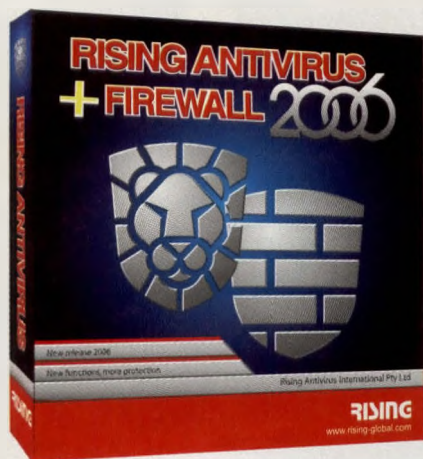
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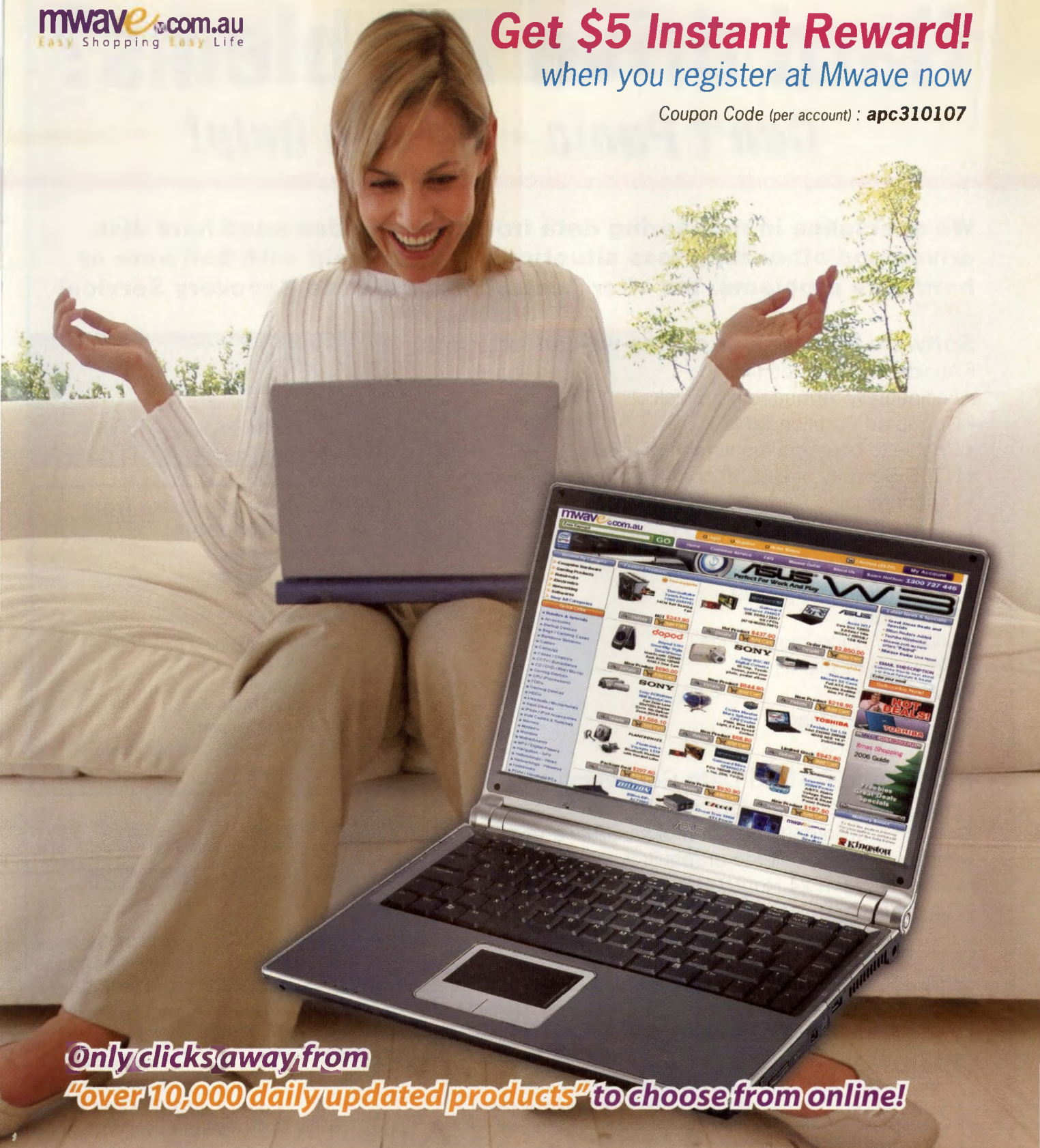
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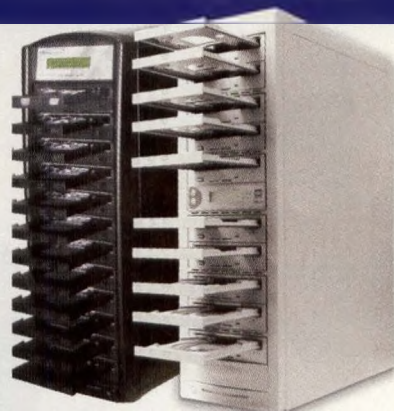
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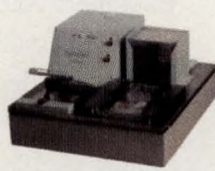
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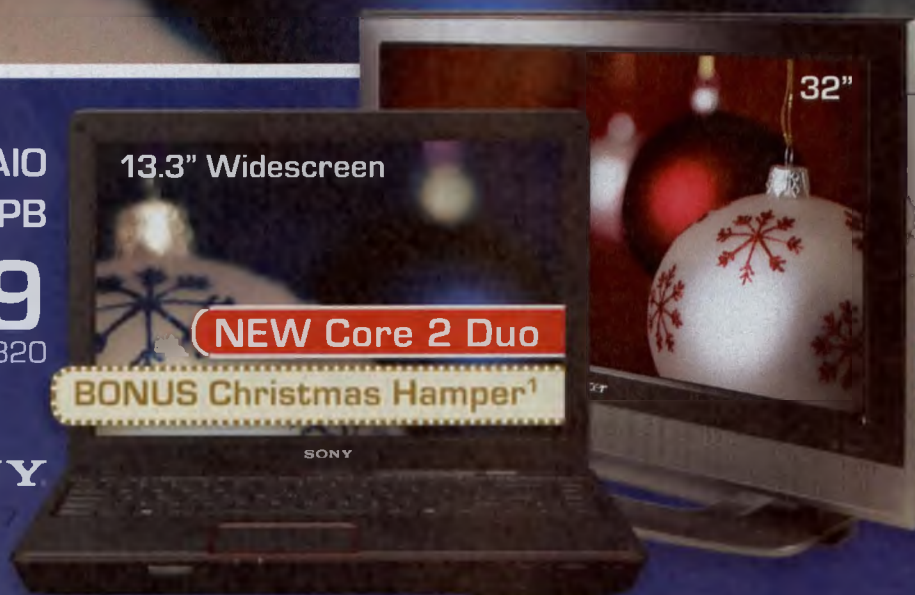
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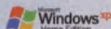


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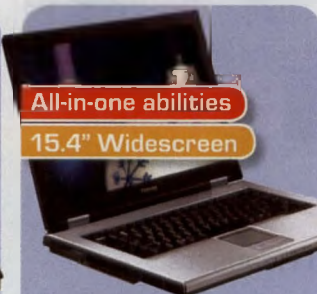
Rent* 11.19/pw

nx6310
Intel Celeron M 430
1.7GHz
512MB DDR2
40GB*
15" XGA
DVD/CD-RW Combo
802.11b/g
2.8kg
Windows XP Home
1 year
Limited Stock



All-in-one abilities

15.4" Widescreen



\$989 | 40862

Rent* 11.08/pw

Sat Pro A120 **TOSHIBA**
Intel Celeron M 410
1.4GHz
512MB DDR2
40GB*
15.4" WXGA
DVD/CD-RW Combo
802.11b/g
2.9kg
Windows XP Home
1 year

\$100 Cashback¹

15.4" Widescreen

BONUS Printer & Bag



BEFORE CASHBACK
YOU PAY \$1299

\$1199 | 36879

Rent* 14.56/pw

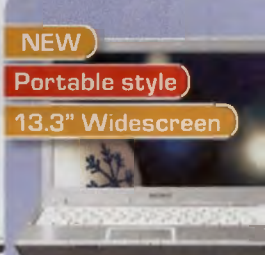
TM 4200AWLM **acer**
Intel Core Solo T1350
1.8GHz
512MB DDR2
60GB*
15.4" WXGA
DVD SuperMulti Dual Layer Drive
802.11a/b/g
2.8kg
Windows XP Home
1 year
Limited Stock



NEW

Portable style

13.3" Widescreen



\$1499 | 7155

Rent* 16.80/pw

VAIO C12GPW **SONY**
Intel Celeron M 430
1.7GHz
512MB DDR2
80GB*
13.3" WXGA Clear Bright
DVD Supermulti Dual Layer Drive
802.11a/b/g & Bluetooth v2.0
2.3kg
Windows XP Professional
1 year



512MB RAM | \$179 | U0074
Spare AC Adaptor | \$75 | T7175
Docking Station | \$295 | T7178

512MB RAM | \$127 | T5503
Spare AC Adaptor | \$58 | T7848
Auto/Air Adaptor | \$180 | N2037

512MB RAM | \$169 | T7032
Spare AC Adaptor | \$138 | T7171
USB Port Replicator | \$118 | P2695

512MB RAM | \$119 | U1950
Spare AC Adaptor | \$169 | 13
Port Replicator | \$359 | U194

3 WAYS TO SHOP CALL
CLICK VISIT

harris technology



Notebooks



Authorised
Solutions Reseller



Apple MacBook 1.8GHz - White

\$1699 SAVE \$50

T8723 | **RENTSMART**

- Intel Core Duo 1.8GHz
- 2x256MB RAM
- 60GB* Hard Drive
- 13.3" 1280x800 widescreen display
- DVD/CD-RW Combo drive
- Built-in AirPort Extreme & Bluetooth 2.0
- White durable, ultratough polycarbonate case
- Limited Stock

Apple MacBook 2GHz - White

\$1849 SAVE \$250

T8724 | **RENTSMART**

- Intel Core Duo 2GHz
- Slot-load SuperDrive (DVD±RW, CD-RW)
- All features from model above (unless otherwise stated)
- Limited Stock

web links

ACER

acer.ht.com.au

APPLE

ht.com.au/apple

BELKIN

belkin.ht.com.au

HP

hp.ht.com.au

RENTSMART

rentsmart.ht.com.au

TARGUS

targus.ht.com.au

TOSHIBA

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* Available capacity of hard drive may be less due to preinstalled software

¹Cashback via redemption from Acer. See www.acer.com.au/cashback for terms & conditions. Redemption postage fees apply.

15" Screen

\$100 PRICE DROP

Fastest AMD Processor to date^

BONUS HP Officejet 5610 Printer



6325

\$1799 | 91488

RENTSMART



AMD Turion 64 X2 TL-60 2GHz
Dual Core Processor
2 x 512MB DDR2 RAM
100GB* Hard Drive
DVD SuperMulti Dual Layer Drive
Wireless LAN 802.11b/g

- 15" XGA Screen
- Up to 3 hours of battery life
- Weighs 2.7kg
- Windows XP Professional
- Windows Vista Capable

^ As of 15/11/06

Powerful
Add-ons

Docking Station | \$295 | T7178

3 yr Harris Technology Extended Warranty | \$239 | S0601

Spare AC Adaptor | \$75 | T7175

Travel Battery | \$195 | R6672

Satellite Pro A120

TOSHIBA

\$1539 | U1592

RENTSMART

Intel Core Duo T2300 1.6GHz
512MB DDR2 RAM
60GB* hard drive
DVD SuperMulti Dual Layer Drive
Wireless LAN 802.11a/b/g
15.4" WXGA Widescreen
Windows XP Professional

NEW

15.4" Widescreen

Versatile Mobile Performance



Powerful
Add-ons

512MB RAM | \$127 | T5503

Spare AC Adaptor | \$58 | T7848

Traditional Notebook Case | \$75 | 56233

Targus Auto/Air Adaptor | \$180 | N2037

Call 1300 13 9999 | Click ht.com.au | Visit our stores

December 06

All in one performance series...

BELKINChristmas
Mobility Bundle**\$99**

U1486

Includes:
Notebook Bag, USB
Retractable Mouse,
7in1 Cable Kit &
FolioWeekender/
Overnighter
Trolley Case**\$149**

T8831

**RENTSMART**
Business Rental Solutions

Model
Processor
Clock Speed
RAM
Hard Drive*
Screen
Optical Drive
Wireless LAN
Weight
Operating System
Warranty

Performance | Looking for something with a little more pep? These notebooks have more memory, larger hard drives, and better graphics capabilities.

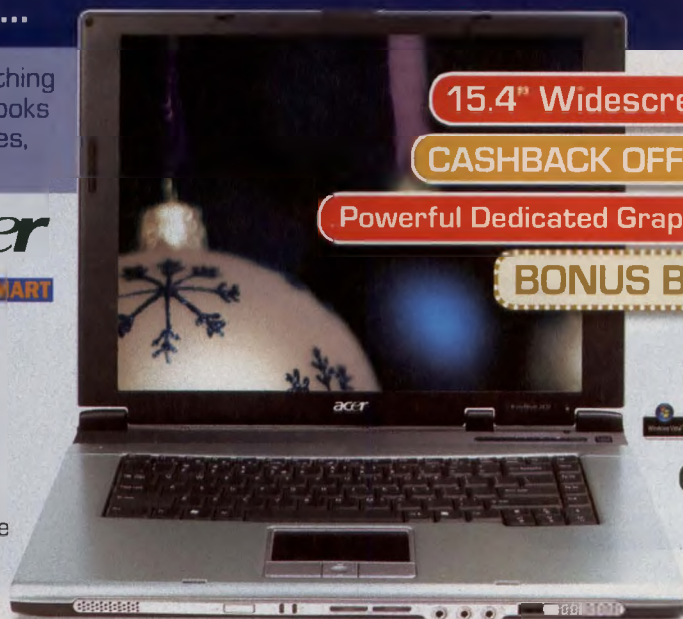
TravelMate 4234WLMi

acer**\$1899**

| A0135

BEFORE CASHBACK YOU PAY \$1999

- Intel Core 2 Duo T5600 1.8GHz
- 1GB DDR2 RAM
- 120GB* Hard Drive
- DVD SuperMulti Dual Layer Drive
- nVidia Go 7300 with 256MB TurboCache
- Wireless LAN 802.11a/b/g
- 15.4" WXGA Widescreen
- Up to 3.5 hours of battery life
- Weighs 2.77kg
- Windows XP Professional
- Windows Vista Premium ready

**15.4" Widescreen****CASHBACK OFFER¹****Powerful Dedicated Graphics****BONUS BAG****Powerful Add-ons**Spare AC Adaptor | \$138 | T7171
3 yr Harris Technology Extended Warranty | \$239 | S0601

Dedicated Graphics
14.1" Widescreen
BONUS HP Printer

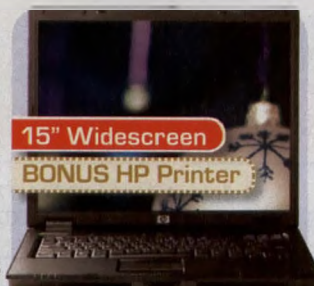
**\$1999** | U0258

Rent* 22.40/pw

nx6330
Intel Core 2 Duo T5500
1.6GHz
512MB DDR2
60GB*
14.1" WXGA
DVD±RW+DL
802.11a/b/g
2.4kg
Windows XP Professional
1 year



15" Widescreen
BONUS HP Printer

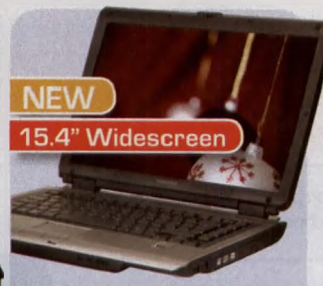
**\$1899** | U0942

Rent* 21.28/pw

nx6320
Intel Core 2 Duo T5500
1.6GHz
512MB DDR2
60GB*
15" XGA
DVD±RW+DL
802.11a/b/g
2.8kg
Windows XP Professional
1 year



NEW
15.4" Widescreen

**\$1979** | U1593

Rent* 22.18/pw

Tecra A6 TOSHIBA
Intel Core 2 Duo T5500
1.6GHz
512MB DDR2
60GB*
14.1" WXGA
DVD SuperMulti Dual Layer
802.11a/b/g & Bluetooth v2.0
2.3kg
Windows XP Professional
1 year

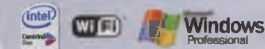


NEW
15.4" Widescreen

**\$1869** | U1601

Rent* 20.94/pw

Tecra A8 TOSHIBA
Intel Core Duo T2300
1.6GHz
256MB + 512MB DDR2
80GB*
15.4" WXGA
DVD SuperMulti Dual Layer
802.11a/b/g
2.9kg
Windows XP Professional
1 year

**Powerful Add-ons**AC Adaptor | \$145 | T7174
Travel Battery | \$195 | R6672
Docking Station | \$295 | T7178
Gold USB Cable | \$20 | 96875AC Adaptor | \$145 | T7174
Travel Battery | \$195 | R6672
Docking Station | \$295 | T7178
Gold USB Cable | \$20 | 96875AC Adaptor | \$144 | T7971
12 Cell Battery | \$213 | R4302
Port Replicator | \$275 | T5500
Gold USB Cable | \$20 | 96875AC Adaptor | \$58 | T7848
Auto/Air Adaptor | \$180 | N2037
3 yr Harris Technology
Extended Warranty | \$239 | S0601

3 WAYS TO SHOP CALL
CLICK VISIT

SONY.

VAIO C15GPB

\$1999

28320 | \$22⁴⁰/wk. RENT

- Intel Core 2 Duo T5500 1.6GHz
- 512MB DDR2 RAM
- 80GB Hard Drive
- DVD SuperMulti Dual Layer Drive
- Wireless LAN 802.11 a/b/g
- Bluetooth v2.0
- 13.3" WXGA Clear Bright Widescreen
- nVIDIA GeForce Go 7400 with 256MB TurboCache
- Up to 4 hours battery life
- Weights 2.3kg
- Windows XP Professional



NEW

13.3" Widescreen

BONUS Christmas Hamper

Includes software valued at over \$1000

Are you prepared for the Windows Vista Premium experience?
512MB Additional RAM Upgrade | \$119 | U1950
1GB Additional RAM Upgrade | \$199 | U1951

RAM Install & Test | \$36 | P3095

Latest Core 2 Duo Technology

15.4" Widescreen

BONUS Christmas Hamper

SONY.

VAIO FE35GP

\$2299

U0673 | \$22⁴⁰/wk. RENT SMART

- Intel Core 2 Duo T5600 1.8GHz
- 512MB DDR2 RAM
- 100GB* Hard Drive
- DVD SuperMulti Dual Layer Drive
- nVidia Go 7600 with 128MB VRAM
- 15.4" WXGA Clear Bright Widescreen
- Windows XP Professional

VAIO FE38GP

\$2799

U0674 | \$27⁴⁰/wk. RENT SMART

- Intel Core 2 Duo T7200 2GHz
- 1GB DDR2 RAM
- 120GB* Hard Drive
- DVD SuperMulti Dual Layer Drive
- nVidia Go 7600 with 128MB VRAM
- 15.4" WXGA Clear Bright Widescreen
- Windows XP Professional

harris technology



Notebooks



Authorised
Solutions Reseller

You can even
run windows
software!

NEW

15.4" Widescreen

Apple MacBook Pro 15.4" 2.1GHz

\$3199

U1232 | \$33⁴⁰/wk. RENT SMART

- Intel Core 2 Duo 2.1GHz
- 1GB DDR2 RAM
- 120GB* hard drive
- DVD SuperDrive
- ATI Mobility Radeon X1600 with 128MB Graphics RAM
- 15.4" WXGA+ display

Pre-order now for late December availability

Apple MacBook Pro 17" 2.3GHz

\$3999

U1233 | \$40⁴⁰/wk. RENT SMART

- Intel Core 2 Duo 2.3GHz
- 2GB DDR2 RAM
- 120GB* hard drive
- DVD SuperDrive
- ATI Mobility Radeon X1600 with 256MB Graphics RAM
- 15.4" WXGA+ display

Pre-order now for late December availability

web links

ACER

acer.ht.com.au

APPLE

ht.com.au/apple

HP

hp.ht.com.au

RENTSMART

rentsmart.ht.com.au

SONY

sony.ht.com.au

TOSHIBA

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Available capacity of hard drive may be less due to preinstalled software.

*Cashback via redemption from Acer. See www.acer.com.au/cashback for terms & conditions. Redemption postage fees may apply.

Spare AC Adaptor | \$169 | 13283
VAIO Soft Carry Case | \$59 | 33034
Port Replicator | \$449 | B4027

1GB Additional RAM | \$199 | U1951
Extended Battery | \$599 | 54560
3 yr Harris Technology Extended Warranty | \$289 | S0602

Call 1300 13 9999 | Click ht.com.au | Visit our stores

December 06

What is the best solution for you?

Toshiba
EasyGuard

EasyGuard is the name used to encapsulate a wide range of fundamental notebook technologies that enhance your notebook and are simple to use. **Protect** notebooks from the rough and tumble of everyday life. Help you **Connect** and stay connected to a multitude of networks.

Secure your data and intellectual property.

Optimise your notebook and customise its settings.

More information available at:
www.isd.toshiba.com.au/easyguard



Model
Processor
RAM
Hard Drive*
Screen
Optical Drive
Wireless LAN
Weight
Battery Life
Operating System
Warranty

Office Productivity

Programs I use everyday

Extend my Software

Applications to take me further

Sophisticated Printing

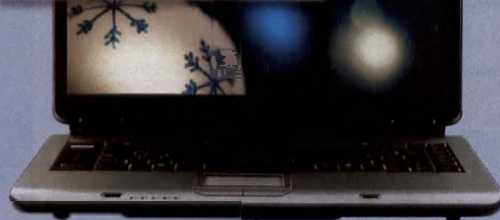
The features I need

Empower my Computing

Give me extra flexibility

NEW

15.4" Widescreen



Home/Small Office

My notebook manages all my work communications and tracks my finances. It also needs to help out with the odd invitation, family photos, or DVD in a pinch.

\$2699 | 28392 **TOSHIBA**



Rent* 28.83/pw

Tecra A7

Intel Core 2 Duo T5600 1.8GHz
1GB DDR2
100GB*
15.4" WSXGA+ Widescreen
DVD SuperMulti Dual Layer
802.11a/b/g & Bluetooth v2.0
2.7kg
Up to 3 hours
Windows XP Professional
1 year

Microsoft Office 2003

Basic | **\$289^** | T4936



MYOB Accounting v16

\$299 | U0169



Canon MP830 Multifunction

\$539 | T6987



Maxtor OneTouch 300GB Drive
with backup | **\$299** | U0248



13.3" Widescreen

BONUS Christmas Hamper



Ultimate Mobile Professional

My notebook travels with me and I need reliable technology that won't let me down.

I run multiple programs including databases, e-mail, antivirus and multimedia and I expect my notebook to keep up.

\$3699 | 69892 **SONY**

Rent* 38.53/pw

VAIO SZ38GP

Intel Core 2 Duo T7200 2GHz
1GB DDR2
120GB*
13.3" WXGA Clear Bright Widescreen
DVD SuperMulti Dual Layer
802.11a/b/g & Bluetooth v2.0
1.69kg
Up to 6.5 hours
Windows XP Professional
1 year

Microsoft Office 2003

Professional | **\$529^** | T5025



Dragon Naturally Speaking

\$179 | T9229



Canon Portable Inkjet

\$429 | R8579



O2 XDA Atom Exec PDA

\$1199 | T8955



Images for illustration purposes only

*OEM pricing only available when purchased in conjunction with a new notebook.

Powerful machines...

Powerful | What are you compromising for? Select from the most powerful notebooks on the marketing. These machines are built using the latest processors, communications and storage technology



PRICE DROP

15.4" Widescreen

BONUS 512MB RAM & BAG

TOSHIBA

Tecra A7

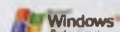
\$2399 | A8725

- Intel Core Duo T2400 1.8GHz
- 512MB DDR2 RAM
- 100GB* Hard Drive
- DVD SuperMulti Dual Layer Drive
- Wireless LAN 802.11a/b/g
- Bluetooth v2.0
- 15.4" WSXGA+ Screen
- Windows XP Professional
- Limited Stock

Toshiba EasyGuard
3D Hard Drive Protection
Spill resistant keyboard
Tested Platform Module



Bluetooth



15" Screen

BONUS Printer



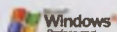
nx6320

\$2799 | U0255

- Intel Core 2 Duo T7200 2GHz
- 1GB DDR2 RAM
- 80GB* Hard Drive
- DVD±RW Dual Layer Drive
- Wireless LAN 802.11a/b/g
- Bluetooth v2.0
- 15" SXGA+ Screen
- Windows XP Professional



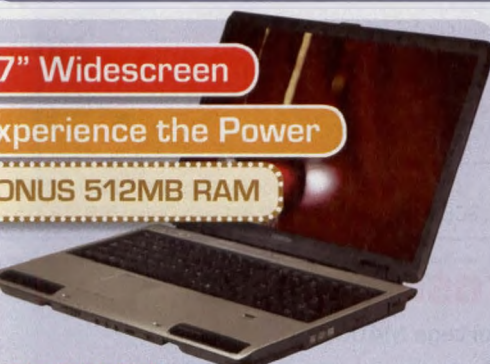
Bluetooth



Powerful Add-ons

Port Replicator for A7 | \$275 | T5500
1GB additional RAM for A7 | \$220 | T5504

Port Replicator for nx6320 | \$295 | T7178
1GB additional RAM for nx6320 | \$347 | T7407



17" Widescreen

Experience the Power

BONUS 512MB RAM

TOSHIBA

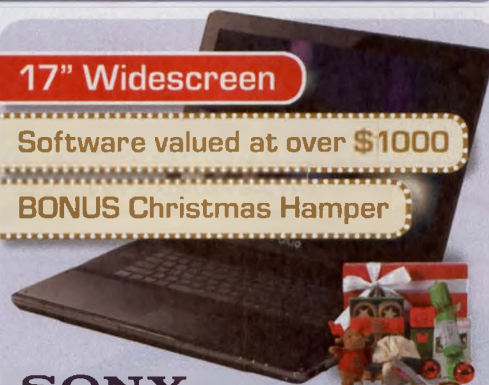
Satellite Pro P100

\$2599 | A7575

- Intel Core Duo T2400 1.8GHz
- 512MB DDR2 RAM
- 100GB* Hard Drive
- DVD SuperMulti Dual Layer Drive
- Wireless LAN 802.11a/b/g
- Bluetooth v2.0
- 17" WSXGA+ Gloss Screen
- Windows XP Professional



Bluetooth



17" Widescreen

Software valued at over \$1000

BONUS Christmas Hamper

SONY

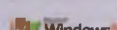
VAIO AR25GP

\$3699 | 40864

- Intel Core 2 Duo T7400 2.1GHz
- 1GB DDR2 RAM
- 200GB* Hard Drive
- DVD SuperMulti Dual Layer Drive
- Wireless LAN 802.11a/b/g
- Bluetooth v2.0
- 17" WXGA+ Clear Bright Screen
- Windows XP Professional



Bluetooth



Toshiba EasyGuard Easy Fix Components, ConfigFree, Diversity Antenna

Powerful Add-ons

1GB additional RAM for AR25GP | \$199 | U1951

Accessories

Wired Mini Optical Mouse

\$39 | C9388



Ambidextrous design mouse uses optical sensor technology & has a retractable USB cable



Desktop USB 2.0 4 Port Hub with Audio Pass-Through

\$49 | T9404



4 easy access high-speed USB ports (2 high power) & stereo audio pass-through for speakers & headset connection



Trademark Topping 300 Edition Notebook

\$89 | 34975



Fits up to a 15.4" widescreen notebook & provides maximum protection with a specially padded honeycomb frame



web links

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hp.ht.com.au
RENTSMART
rentsmart.ht.com.au
SONY
sony.ht.com.au
TARGUS
targus.ht.com.au
TOSHIBA
toshiba.ht.com.au

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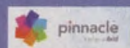
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Available capacity of hard drive may be less due to preinstalled software

Ultra portable series...

Pinnacle PCTV Hybrid Pro Stick 320E

\$239 | T9010



- Use TimeShifting to pause live television and start again without missing a second
- Record to your hard drive in MPEG-1/-2 formats
- Direct-to-DVD recording
- Record directly in DivX format
- Remote control access to all your media files

Logitech QuickCam Fusion

\$159 | T3586



- Monitor front design provides improved eye-to-eye contact
- Provides true 1.3 mega pixel sensor quality
- High quality audio via a built-in microphone
- Available 1.1 or 2.0 USB port

web links

LOGITECH

logitech.ht.com.au

RENTSMART

rentsmart.ht.com.au

SONY

sony.ht.com.au

TARGUS

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Available capacity of hard drive may be less due to preinstalled software.

¹RAM not installed.

²Via redemption from Microsoft. See microsoft.ht.com.au for terms and conditions

Ultra Light | Don't let your notebook be a burden! Designed from the ground up for work and travel, you will not come to regret carrying these notebooks in your car or through an airport, and with the latest wireless and battery technology, they won't slow you down.

12.1" SCREEN

Only 20mm thin



TOSHIBA

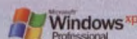
Portege R200

\$3299 | T7682

- Intel Pentium M 773 1.3GHz ULV
- 512MB + 256MB DDR RAM
- 60GB* Hard Drive
- Wireless LAN 802.11a/b/g
- Bluetooth v2.0
- 12.1" XGA Screen
- Weighs 1.3kg
- Windows XP Professional
- 3 year warranty



Wi-Fi



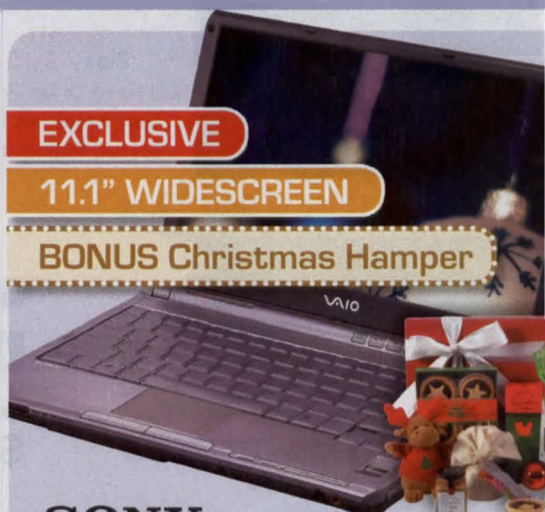
Port Replicator for Toshiba R200 | \$385 | T6205
3 year Harris Technology Extended Warranty | \$289 | S0602

Port Replicator for Sony TX | \$359 | 38549
SanDisk 2GB Flash Drive | \$89 | T8375

EXCLUSIVE

11.1" WIDESCREEN

BONUS Christmas Hamper



SONY

VAIO TX47GPB

\$3599 | 41669

- Intel Core Solo U1400 1.2GHz
- 1GB DDR2 RAM
- 80GB* Hard Drive
- 11.1" WXGA Screen
- DVD SuperMulti Dual Layer Drive
- Wireless LAN 802.11a/b/g
- Up to 9.5 hours of battery life
- Weighs 1.25kg
- Windows XP Professional
- 1 year warranty

Also Available:

VAIO TX47GPR | \$3599 | U0734



Wi-Fi



12.1" WIDESCREEN

Great Productivity Tool

BONUS 512MB RAM & Bag¹

TOSHIBA

Portege M400

\$2799 | T5498

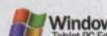
- Intel Core Solo T1300 1.6GHz
- 512MB DDR2 RAM
- 60GB* Hard Drive
- 12.1" XGA TFT Screen
- Wireless LAN 802.11a/b/g
- Microsoft Windows XP Tablet Edition
- 3 year warranty

Also Available

Portege M400 1.8GHz | T5499 | \$3849
Limited stock.



Wi-Fi



Tablet Notebooks | Write your notes straightaway.

Annotate your data on the fly. Draw your ideas live, and e-mail it all to your colleagues.

Power | Don't compromise your decisions. Powerful ultra portable notebooks are perfect for **mobile professionals**. Dual Core technology will power through the most demanding applications, while conserving battery life, and at under 1.9kgs, they can be taken anywhere with confidence.

NEW

21" WIDESCREEN

Deal for mobile professionals



TOSHIBA

Portege M500

\$2899 | 23438

RENT SMART
\$30⁹⁰/wk

- Intel Core 2 Duo T5500 1.6GHz
- 1GB DDR2 RAM
- 60GB* Hard Drive
- DVD SuperMulti Dual Layer Drive
- Wireless LAN 802.11a/b/g
- Bluetooth v2.0
- 12.1" WXGA CSV Screen
- Weighs 1.86kg
- Windows XP Professional
- 3 year warranty



EXCLUSIVE

13.3" WIDESCREEN

BONUS Christmas Hamper



SONY

VAIO SZ38GP

\$3699 | 69892

RENT SMART
\$38⁹⁰/wk

- Intel Core 2 Duo T7200 2GHz
- 1GB DDR2 RAM
- 120GB* Hard Drive
- 13.3" WXGA Screen
- DVD SuperMulti Dual Layer Drive
- Wireless LAN 802.11a/b/g
- Bluetooth v2.0
- Up to 6.5 hours of battery life
- Weighs 1.69kg
- Windows XP Professional
- 1 year warranty



Also Available:

VAIO SZ34GP | \$2999 | 41558

Powerful
add-ons

AC adaptor for M500 | \$92 | U0592

3 year Harris Technology Extended Warranty | \$289 | S0602

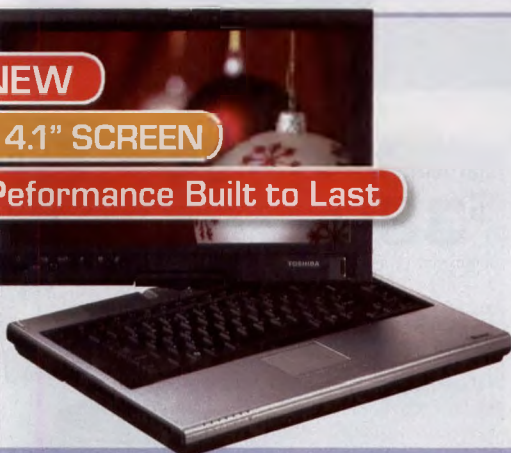
Port replicator for Sony SZ | \$369 | T5020

Canon portable printer | \$429 | R8579

NEW

4.1" SCREEN

Performance Built to Last



TOSHIBA

Tecra M7

\$3999 | U1429

RENT SMART
\$40⁹⁰/wk

- Intel Core 2 Duo T7200 2GHz
- 1GB DDR2 RAM
- 80GB* Hard Drive
- DVD SuperMulti Dual Layer Drive
- 14.1" WXGA+ Screen
- Wireless LAN 802.11a/b/g
- Bluetooth v2.0
- Microsoft Windows XP Tablet Edition
- 3 year warranty



AC adaptor for M400 & M7 | \$92 | U0592

3 year Harris Technology Extended Warranty | \$289 | S0602

Targus tablet PC & notebook stand | \$35 | M9827

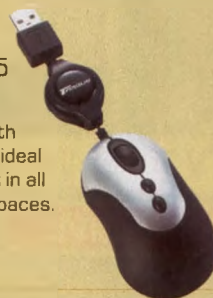
LaCie 120GB USB Hard Drive | \$199 | U1315

Accessories

Targus Ultra Mini 5 Button Optical Mouse

\$39 | 40655

Ultra mini mouse with retractable cable is ideal for travel and can fit in all cases with limited spaces.



Targus

Targus Hardsided Slimline Notebook Case

\$59 | U0166

Fits up to 15.4" notebooks in a lightweight and slimline design.



Targus

Targus XS Notebook Case

\$89 | U0167

Perfect for smaller notebooks and tablets - fits up to 14.1" notebooks as well as your files.



Targus

Microsoft Wireless Optical Desktop Elite

\$175 | L0515

Microsoft



BONUS Microsoft Laser Mouse or \$40 Cashback²

Logitech diNovo Media Desktop Bluetooth Laser

\$320 | T3582



"Advanced Desktop for your digital world"

Desktop deals...



TV Tuner Included

EXCLUSIVE

Aspire E650 Viiv

\$1299

A7342 | \$14.98/wk RENT SMART

- Processor: Intel Viiv Technology Intel Pentium D 820 2.8GHz
- Memory: 1GB DDR2 RAM (2 x 512MB)
- Hard Drive: 160GB* SATA
- Optical Drive: 16x Dual Layer DVD±RW
- Operating System: Windows XP Media Centre Edition
- Warranty: 1 year limited onsite

Aspire E650 Viiv Bundle

\$1699

A7467 | \$19.94/wk RENT SMART

- Processor: Intel Viiv Technology Intel Pentium D 820 2.8GHz
- Memory: 1GB DDR2 RAM (2 x 512MB)
- Hard Drive: 300GB* SATA
- Optical Drive: 16x Dual Layer DVD±RW
- Operating System: Windows XP Media Centre Edition
- Monitor: 19" Widescreen LCD monitor
- Warranty: 1 year limited onsite



web links

ACER
acer.ht.com.auAPPLE
ht.com.au/apple
HP
hp.ht.com.auRENTSMART
rentsmart.ht.com.au
SAMSUNG
samsung.ht.com.au

Please note: All purchases subject to terms & conditions and returns policy. Delivery charges may apply. Not all items stocked in store but available for pick-up/delivery.

Rentsmart: The figures quoted are based on a per week basis over 3 years. Terms and conditions apply. For details see: rentsmart.ht.com.au

* Available capacity of hard drive may be less due to preinstalled software

† Available via redemption from Acer from 01/11/06 to 30/11/06. Visit acer.ht.com.au for details.



EXCLUSIVE

HP dx2200
Microtower

\$799 DESKTOP ONLY

A7473 | \$8.95/wk RENT SMART

- Processor: Intel Pentium 4 524 3.0GHz
- Memory: 512MB DDR2 RAM
- Hard Drive: 80GB# SATA (7200RPM)
- Optical Drive: 16x Dual Layer DVD±RW
- Operating System: Windows XP Professional
- Warranty: 1 year limited on-site

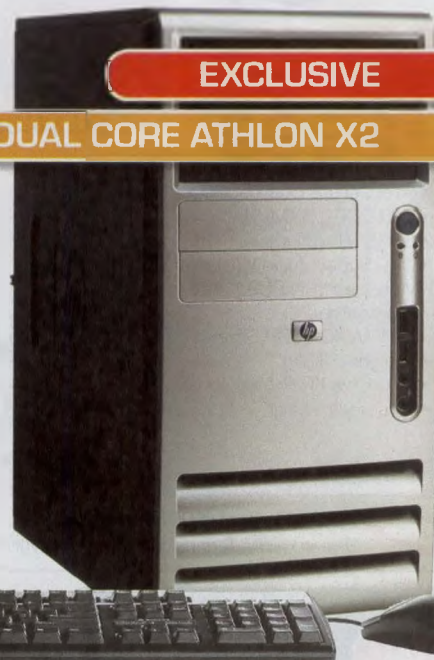


HP dx5150 Microtower

\$1099

T8601 | \$12.99/wk RENT SMART

- Processor: AMD Athlon 64 X2 3800+ (Dual Core)
- Memory: 1GB PC3200 DDR400
- Hard Drive: 160GB# SATA (7200RPM)
- Optical Drive: 16x Dual Layer DVD±RW
- Graphics: Integrated ATI graphics processor derived from the Radeon X300
- Operating System: Windows XP Professional
- Warranty: 3 year parts, 1 year labour & on-site

EXCLUSIVE
DUAL CORE ATHLON X2

Samsung 740N

\$289

S9509 | 17"



- Viewable Image Size: 19"
- Interface: Analogue & Digital
- Resolution: 1280 x 1024
- Contrast Ratio: 700:1
- Response Time: 8ms
- Height adjust & pivot stand
- 3 year onsite exchange and zero dead pixel policy



Samsung 920N

\$389

T3827 | 19"



- Viewable Image Size: 19"
- Interface: Analogue & Digital
- Resolution: 1280 x 1024
- Contrast Ratio: 700:1
- Response Time: 8ms
- Height adjust & pivot stand
- 3 year onsite exchange and zero dead pixel policy



AcerPower F6 Microtower

\$1299 DESKTOP
ONLY

A7465 | 

**BEFORE CASHBACK
YOU PAY \$1399**

- **Processor:** Intel Core 2 Duo E6300
- **Memory:** 1GB DDR2 RAM (2 x 512MB)
- **Hard Drive:** 250GB* SATA (7200RPM)
- **Optical Drive:** 16x Dual Layer DVD±RW
- **Operating System:** Windows XP Professional
- **Warranty:** 1 year limited onsite



BONUS \$100 CASHBACK¹

CORE 2 DUO POWER

AcerPower F6 Microtower

\$1199

A7317 | 

AcerPower F6 Microtower

\$999

U0942 | 

EXCLUSIVE

Affordable Dual Core Performance

- **Processor:** Intel Pentium D 945 3.4GHz
- **Memory:** 1GB DDR2 RAM (2 x 512MB)
- **Hard Drive:** 250GB* SATA (7200RPM)
- **Optical Drive:** 16x Dual Layer DVD±RW
- **Operating System:** Windows XP Professional
- **Warranty:** 1 year limited onsite



- **Processor:** Intel Pentium D 805 2.66GHz
- **Memory:** 1GB DDR2 RAM (2 x 512MB)
- **Hard Drive:** 160GB* SATA (7200RPM)
- **Optical Drive:** 16x Dual Layer DVD±RW
- **Operating System:** Windows XP Professional
- **Warranty:** 1 year limited onsite



Samsung 203B

\$489

T5571 | 20"



- Viewable Image Size: 19"
- Interface: Analogue & Digital
- Resolution: 1280 x 1024
- Contrast Ratio: 700:1
- Response Time: 8ms
- Height adjust & pivot stand
- 3 year onsite exchange and zero dead pixel policy



Desktops



Integrated Wireless

Apple Mac Mini

\$1249  U0309

- **Processor:** Intel Core Duo 1.83GHz with 2MB shared cache
- **Memory:** 512MB DDR2 PC2-5300
- **Hard Drive:** 80GB* SATA (5400RPM)
- **Optical Drive:** Slot load 8x Double Layer DVD±RW Superdrive
- **Operating System:** Mac OS X v10.4 Tiger
- **Warranty:** 1 year limited



Integrated i-Sight Video Camera

Apple iMac 17"

\$1849  T8906

- **Processor:** Intel Core 2 Duo 2GHz with 4MB shared L2 cache
- **Memory:** 1GB DDR2 PC2-5300
- **Hard Drive:** 160GB* SATA (7200RPM)
- **Optical Drive:** Slot load 8x Double Layer DVD±RW Superdrive
- **Operating System:** Mac OS X v10.4 Tiger
- **Display:** 17" widescreen LCD with 1440 x 900 resolution
- **Warranty:** 1 year limited

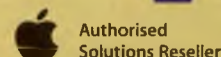


Apple iMac 20"

\$2299  A7340

ATI Radeon X1600 Graphics

- **Processor:** Intel Core 2 Duo 2.16GHz with 4MB shared L2 cache
- **Memory:** 1GB DDR2 PC2-5300
- **Hard Drive:** 250GB* SATA (7200RPM)
- **Optical Drive:** Slot load 8x Double Layer DVD±RW Superdrive
- **Operating System:** Mac OS X v10.4 Tiger
- **Display:** 20" widescreen LCD with 1680 x 1050 resolution
- **Warranty:** 1 year limited





Monitors...

Entry Level...

Acer AL1716S

\$289

SILVER | T3247

- Viewable Image Size: 17"
- Interface: Analogue
- Resolution: 1280 x 1024
- Contrast Ratio: 500:1
- Response Time: 8ms
- 3 years limited warranty



acer

Acer AL1916S

\$369

T4734 | SILVER

- Viewable Image Size: 19"
- Interface: Analogue
- Resolution: 1280 x 1024
- Contrast Ratio: 500:1
- Response Time: 8ms
- 3 years limited warranty



acer

Value Level...

Samsung 740B

\$339S9253 | BLACK
S9248 | SILVER

- Viewable Image Size: 17"
- Interface: Analogue & Digital
- Resolution: 1280 x 1024
- Contrast Ratio: 600:1
- Response Time: 8ms
- Height adjust & pivot stand
- 3 year on site exchange and zero dead pixel policy^



SAMSUNG



Samsung 940B

\$429S8307 | BLACK
S8306 | SILVER

- Viewable Image Size: 19"
- Interface: Analogue & Digital
- Resolution: 1280 x 1024
- Contrast Ratio: 700:1
- Response Time: 8ms
- Height adjust & pivot stand
- 3 year onsite exchange and zero dead pixel policy



SAMSUNG



Premium Level...

NEC 90GX2 Opticlear

\$725T6791 | ^{\$8¹²}/wk* RENTSMART
BLACK/SILVER TRIM

Fast Response Time

- Viewable Image Size: 19"
- Interface: Analogue & Digital
- Resolution: 1280 x 1024
- Contrast Ratio: 700:1
- Response Time: 4ms
- OptiClear screen technology
- 3 years limited warranty



NEC

Samsung 215TW Widescreen

\$939^{\$10⁹⁹}/wk* RENTSMART
T6656 | BLACK

- Viewable Image Size: 21" Widescreen
- Interface: Digital & Analogue
S-Video, Component & Composite
- Resolution: 1680 x 1050
- Contrast Ratio: 1000:1
- Response Time: 8ms
- Integrated speaker & headphone jack
- Height adjust, pivot and swivel stand
- 3 year on site exchange and zero dead pixel policy^



SAMSUNG



MULTIPLE INPUTS

BONUS 1GB USB Key

Display

Samsung 920N

\$389

T3827 | SILVER

- Viewable Image Size: 19"
- Interface: Analogue
- Resolution: 1280 x 1024
- Contrast Ratio: 700:1
- Response Time: 8ms
- 3 year on site exchange and zero dead pixel policy[^]



Samsung 203B

\$489

T5571
BLACK/SILVER TRIM

- Viewable Image Size: 20"
- Interface: Analogue & Digital
- Resolution: 1400 x 1050
- Contrast Ratio: 600:1
- Response Time: 8ms
- Height adjust, pivot, swivel and tilt stand
- 3 year on site exchange and zero dead pixel policy[^]



BONUS 1GB USB Key

NEC 20WGX2 Opticlear

\$1049

\$1175/wk RENT SMART

T7691
BLACK/SILVER TRIM

- Viewable Image Size: 20" Widescreen
- Interface: Analogue & Digital
- Resolution: 1680 x 1050
- Contrast Ratio: 1600:1
- Response Time: 6ms
- OptiClear screen technology
- Tilt & swivel adjust for viewing comfort
- 3 years limited onsite warranty



STUNNING IMAGE QUALITY

BONUS NDV28 DVD Player¹

Acer AL2416WD

\$1199 **\$1349/wk RENT SMART**
A7514



24" WIDESCREEN

HOT PRICE

- Viewable Image Size: 20" Widescreen
- Interface: Analogue & Digital
- Resolution: 1920 x 1200
- Contrast Ratio: 1000:1
- Response Time: 6ms
- Brightness: 500cd/m²

acer

Apple 23" Cinema HD Display LCD

\$1599 **\$1799/wk RENT SMART**
T8637



23" WIDESCREEN

- Viewable Image Size: 23" Widescreen
- Interface: Digital
- Resolution: 1920 x 1200
- Contrast Ratio: 400:1
- Response Time: 14ms
- Brightness: 270cd/m²

Apple Authorised
Solutions Reseller

web links

ACER
acer.ht.com.au

APPLE
ht.com.au/apple

NEC
nec.ht.com.au

RENTSMART
rentsmart.ht.com.au

SAMSUNG
samsung.ht.com.au

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[^]Please contact Samsung Electronics Australia on: **1300 362 603** or email: monitor.service@samsung.com for full terms and conditions. ¹Offer available via redemption from NEC from 01/12/2006 and 31/12/2006 via redemption from Samsung. See nec.ht.com.au for more details. Postage fees apply.

Projectors...

NEC VT-49 LCD Projector

\$999 | U1308 \$11¹⁹/wk* RENTSMART

NEC



- LCD Technology
- SVGA resolution
- 1600 ANSI Lumens
- 600:1 Contrast ratio
- Multiple input terminals
- Lamp life 3000 hours
- Compact 2.8kg
- Integrated speaker
- 2 years limited warranty†

NEC VT-490 LCD Projector

\$1279 | U1309 \$14³³/wk* RENTSMART**BONUS \$50 Coles Myer Gift Card²**

- LCD Technology
- SVGA resolution
- 2000 ANSI Lumens
- Wall colour correction
- Compact: 2.9kg
- Security function
- Quick start and power off function
- Includes soft carry case and remote
- 2 years limited warranty†

web links

ACER
acer.ht.com.au
NEC
nec.ht.com.au
RENTSMART
rentsmart.ht.com.au

SAMSUNG
samsung.ht.com.au
SONY
sony.ht.com.au
TOSHIBA
toshiba.ht.com.au

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†Warranty conditions apply.

¹Purchase a TDP-S35, TDP-T45 or TLP-XD2000 Projector from 01/10/06 - 31/11/06 and receive 1 x Bonus Aluminium Case or 1 x Pull Down Screen via redemption directly from Toshiba. Visit toshiba.ht.com.au for redemption form and full terms and conditions.

TOSHIBA PROJECTOR
BONUS¹

TDP-T9 DLP Projector

\$1749 | T6349 \$19⁶⁰/wk* RENTSMART

- DLP Technology
- XGA Resolution
- 2000 ANSI Lumens
- 2000:1 Contrast ratio
- ECO Mode: reduces noise and extends lamp life
- Compact 2kg
- Includes soft carry case and remote control

QUALITY ASSURANCE WARRANTY
ON ALL TOSHIBA PROJECTORS

VPL-CX21 XGA Projector

\$2399 | A7588 | \$25⁶³/wk* RENTSMART

SONY

3LCD



VPL-CS21 SVGA Projector

\$1779 | P1841 | \$19⁹⁴/wk* RENTSMART

- 3LCD Technology
- XGA & SVGA resolution
- 2100 ANSI Lumens
- Macintosh® compatible
- Accepts Digital TV signals, including HDTV up to 1080/50i
- Multiple inputs
- Password security and control panel lock
- Image flip and image freeze function
- Includes soft carry case and remote
- 2 years limited warranty†

3 WAYS TO SHOP CALL
CLICK VISIT

harristechnology



Display LCD TV

Acer AT3220B 32"
LCD TV

acer

\$1399 \$15⁵⁶/wk **RENTSMART**
| A7460



- AT3220B: 32" (80cm)
- Resolution: 1366 x 768
- Brightness: 500 nits
- Contrast ratio: 1200:1
- Display colour: 16.7million
- Response Time: 8ms
- Weight: 17.7kg

Acer AT3720B 37" Widescreen
LCD TV

\$1989 \$22²⁸/wk **RENTSMART**
| U1310



- AT3720B: 37" (93cm)
- Resolution: 1366 x 768
- Brightness: 500 nits
- Contrast ratio: 1200:1
- Display colour: 16.7million
- Response Time: 8ms
- Weight: 17.7kg
- Wall mountable
- HDMI input
- HD TV ready

Recieve a **BONUS** Centrex 120GB SDTV
Receiver & 84" Pull Down Screen when you
purchase the Toshiba T9 or S35 projector

TDP-S35 DLP Projector

TOSHIBA

\$1299 \$14⁵⁶/wk **RENTSMART**
| T8918

BONUS¹



- DLP Technology
- SVGA Resolution
- 2000 ANSI Lumens
- 2000:1 Contrast ratio
- Compact 3.0kg
- Integrated speaker
- Includes soft carry case and remote control

- 3 year parts and labour
- 90 day lamp & faulty product replacement

P8 DLP Projector

TOSHIBA

\$2559 \$27³⁶/wk **RENTSMART**
| T3878



ULTIMATE PORTABILITY ONLY 1KG

- DLP Technology
- XGA Resolution
- 1500 ANSI Lumens
- 2100:1 Contrast ratio
- Compact 1.0kg
- Perfect combination: extremely mobile and bright
- Includes soft carry case and remote
- 3 year warranty

Call 1300 13 9999 | Click ht.com.au | Visit our stores

December 06

Digital Cameras...

Canon IXUS 60 **\$399** | T9645



SAVE \$50

- 6.0 megapixel
- Canon 3x optical zoom lens
- Large 2.5 inch LCD screen
- Super fast DIGIC II imaging processor

Energizer 8Hrs Sliding Charger

\$36⁹⁸

U0928

Equipped with intelligent features such as safety timers, temperature monitors and trickle charge technologies.



web links

CANON
canon.ht.com.au
NAVMAN
navman.ht.com.au
OLYMPUS
olympus.ht.com.au
RENTSMART
rentsmart.ht.com.au
SANDISK
sandisk.ht.com.au
TOMTOM
tomtom.ht.com.au
UNIDEN
uniden.ht.com.au

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Rentsmart: The figures quoted are based on a per week basis over 3 years. Terms and conditions apply. For details see: rentsmart.ht.com.au.

*Offer available from Canon from 01/12/06 to 31/12/06 via redemption from Canon. See canon.ht.com.au for more details.

Canon MV920 MiniDV Camcorder

\$399 | U1296
AFTER CASHBACK | **YOU PAY \$474**

Canon
advanced simplicity

CASHBACK OFFER¹



- Powerful Canon 25x zoom lens
- High resolution 800k pixel CCD and DIGIC DV for outstanding image quality
- Stylish and compact, designed for simple operation
- 2.7" Widescreen LCD and Real Widescreen recording for breathtaking playback
- * Microphone input connection

Canon DC100 -DVD Camcorder

\$599 | U1289
AFTER CASHBACK | **YOU PAY \$699**

Canon
advanced simplicity

CASHBACK OFFER¹



- Super small and lightweight for ultimate portability
- Direct-to-DVD shooting for convenient playback on home DVD players
- Powerful Canon 25x video zoom lens
- 800K CCD and DIGIC DV for high quality videos
- Wide 2.7" LCD Screen
- Photo capture to DVD

Uniden UDC-5M Digital Camera

\$199 | U1068

- 5.1M High Density Digital Images
- Super Long Battery Life
- Automatic Image Stabiliser
- High Quality 3 X Optical Zoom
- Large 2.5" TFT LCD Monitor
- Records High Quality Video
- PictBridge™ Compatible
- 15 Automated Shooting Modes
- USB 2.0 Supported
- Built-In Flash with Red Eye Reduction
- 26 MB Internal Memory
- Stylish Compact Design
- Designed and Engineered in Japan



Sony DSCW30S Digital Camera

\$349 | U1299 **SONY.**



- 6.0 megapixel
- Carl Zeiss Vario-Tessar Lens
- 3X Optical Zoom
- 2.0" LCD Screen
- RIMP - Real Imaging Processor
- Anti Blur system with High Sensitivity
- MPEG Movie VX Fine
- 32MB Internal Memory

Canon PSA530 Digital Camera

\$249 | U1297

Canon
advanced simplicity



SAVE \$20

- 5.0 megapixel
- Canon 4x optical zoom lens
- Movie recording and playback with sound
- DIGIC Imaging Processor delivers superior digital photos
- Print/Share* Button allows easy 'one push' printing of images straight from the camera

3 WAYS TO SHOP CALL
CLICK VISIT

GPS Navigation...

BONUS

Uniden UHF
Cominicators
with every GPS

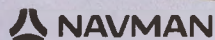


Navman F20 Portable GPS Navigator

\$699 \$7.83/wk. RENT SMART
|U0755



**Nearest Fuel &
Parking Buttons**



Simple, color-coded easy to use interface

- 3.5" touch screen
- Nearest fuel and parking buttons
- Slim, lightweight design
- Speed and red light camera warnings (via optional connectivity pack)
- Auto switching day and night display
- 2006 (V13) Australia-wide mapping
- 'Navigate to home' button
- Avoid tolls/ferries/unsealed roads

Uniden GNS8350 GPS Navigation

\$699 \$7.83/wk. RENT SMART
|U0576



Uniden

- High definition 3.5" LCD display
- Simple & easy to use with fast programming and a touch control screen
- Easy to navigate maps with dynamic voice and visual guidance
- Fixed speed, red light & black spot warning
- Unique night mode for easy glare free view
- Different visual guidance views
- Half million points of interest

HP iPAQ rx5765 Travel Companion

\$799 \$8.95/wk. RENT SMART
|U1293



- Integrated SiRFstarIII GPS receiver
- Integrated omni-directional GPS antenna
- Navigation software and maps pre-installed
- Samsung 400MHz processor
- Secure Digital (SD/SDIO) expansion slot
- 3.5" QVGA touch screen panel with antiglare

Navman N40 Portable GPS Navigator

\$799 \$8.95/wk. RENT SMART
|U0756



NAVMAN

Simplified, icon based interface

- 3.5" touch screen
- Integrated NavPix camera with navigation to photos
- Nearest fuel and parking buttons
- Slim, lightweight design
- Speed and red light camera warnings via free download from website
- 2006 (V13) Australia-wide mapping
- 'Navigate to home' button

harristechnology



GPS Navigation

TomTom GO710

tomtom

\$899 \$10.97/wk. RENT SMART
|T9874



- 4.0" anti-glare widescreen LCD with crystal-clear 3D graphics
- Hands-free calling for your mobile phone using Bluetooth® technology. So you can make and receive calls as you drive with just a touch of the screen.
- iPod® control: Connect your iPod® and operate it via the touchscreen and enjoy MP3's through the high quality speaker or via your car stereo
- The latest maps with pre-installed Safety Cameras database
- Door-to-door and Itinerary planning with Choice of Routes

TomTom GO910

\$1099 \$12.99/wk. RENT SMART
|T9875



- Built-in MP3 player
- 20GB hard disk for storing space for 1000's of your favourite songs and photos
- Text-to-speech function for clear spoken instructions, including street and place names (will even read out SMS messages on compatible phones)
- Remote control
- The latest maps with pre-installed safety cameras database
- Includes carry case, home dock, Windscreen dock, external microphone, 12-24V car charger, and Lithium-Ion battery

PDAs & Smart Phones...

web links

FRESHTEL
freshtel.ht.com.au
HP
hp.ht.com.au
I-MATE
imate.ht.com.au
LINKSYS
linksys.ht.com.au
NETCOMM
netcomm.ht.com.au
O2
o2.ht.com.au
PALM
palm.ht.com.au
RENTSMART
rentsmart.ht.com.au
UNIDEN
uniden.ht.com.au

Please note:
All purchases
subject to terms
& conditions and
returns policy.
Delivery charges
may apply. Not all
items stocked in
store but available
for pick-up/delivery.
* See box for details.

Rentsmart: The
figures quoted are
based on a per
week basis over 3
years. Terms and
conditions apply.
For details see:
rentsmart.ht.com.au

HP iPAQ rx4240

\$399 | U1022

Connect, entertain, organise and impress – that is what the rx4240 brings to mind. Whether for work or pleasure, you can connect to the people and information that is important to you. Entertain yourself by listening to music, surfing the web or play games, all while staying mobile. Organise your work or personal life with Windows Mobile 5.0. Its impressive, sleek design makes it fun and easy to take anywhere.

- Integrated WLAN (802.11b/g);
- Integrated Bluetooth v2.0 + EDR wireless technology;
- Samsung 400 MHz Processor;
- Integrated Secure Digital (SD/SDIO) expansion slot;
- Integrated mini-USB charging/communications port;
- Removable Lithium-ion 1200 mAh battery;
- 2.8" transmissive QVGA TFT display with 64K colors;

Includes: Microsoft Windows Mobile 5.0 software for Pocket PC; Mobile versions of Microsoft Office software included (Word, Excel and PowerPoint)

**\$869** | T7344After Cashback | You pay **\$969**

Rent* 10.86/pw

**\$949** | U0745

Rent* 10.63/pw

**\$1199** | T8990

Rent* 13.43/pw

**\$1199** | T8955

Rent* 13.43/pw

Model
CPU
Memory
Display
Camera
Card Slot
Networks
Wi-Fi
Bluetooth
IrDA
Operating System
Applications

hp iPAQ rx6828 Multimedia Messenger

Intel PXA272 416MHz
128MB ROM/64MB SDRAM
2.7" TFT LCD 1600 x 1200 Res
2 megapixels
mini-SD
Tri-Band GSM/GPRS/EDGE

✓
Microsoft® Windows Mobile 5.0
Outlook Mobile, Office Mobile
(Word, Excel, Powerpoint),
Internet Explorer Mobile

o2 Xda Stealth SmartPhone

Intel XScale PXA272 416MHz
192MB ROM/64MB RAM
2.4" TFT LCD 240 x 320 Res
VGA
mini-SD
Tri-Band GSM/GPRS

✓
Microsoft® Windows Mobile 5.0
Phone, Contacts, Calendar,
VersaMail™ Microsoft Outlook
Synchronisation Software
(Windows only) Web Browser,
HotSync® Manager

i-mate K-JAM

TI OMAP 850 200MHz
128MB ROM/64MB SDRAM
2.8" TFT LCD 240 x 320 Res
1.3 megapixels
mini-SD
Tri-Band GSM/GPRS/EDGE

✓
Microsoft® Windows Mobile 5.0
Microsoft Office Outlook Mobile,
Microsoft Office for Windows
Mobile, Pocket MSN Internet
Explorer Mobile, Windows Media
Player 10 Mobile

XDA Atom Exec

Intel PXA272 520 Mhz
192MB ROM/64MB SDRAM
2.7" TFT LCD 240 x 320 Res
2 megapixels
mini-SD
Tri-Band GSM/GPRS/EDGE

✓
Microsoft® Windows Mobile
Outlook Mobile with Direct P
Technology, Office Mobile
(Word, Excel, Powerpoint),
Internet Explorer Mobile

Cordless & Internet Phones...

Uniden WDECT 2315
Cordless Phone

\$89⁹⁵

U0402



Uniden
SOUNDS BETTER

- 2.4GHz Digital Spread Spectrum
- Designed and engineered in Japan
- Integrated digital answering machine, remote access, Do Not Disturb
- Multi (4) handset capable
- Dual keypad
- Digital duplex speakerphones on handset and base
- Advanced alpha display caller ID features

Uniden DSS 3455+1
Cordless Phone system

\$199

U0406



Uniden
SOUNDS BETTER

- 2.4GHz Digital Spread Spectrum
- Designed and engineered in Japan
- Integrated digital answering machine, remote access
- Multi (4) handset capable
- Dual keypad
- Digital duplex speakerphones on handset and base
- Advanced alpha display caller ID features

Uniden DSS7855+1 Cordless phone
system with answering machine

\$249

U0570



Uniden
SOUNDS BETTER

- 5.8GHz Digital Spread Spectrum
- Designed and engineered in Japan
- Integrated digital answering machine, remote access
- Multi (4) handset capable
- Dual keypad
- Digital duplex speakerphones on handset and base
- Advanced alpha display caller ID features

Uniden WDECT 2345+1
Cordless Phone System

\$179

U0403



Uniden
SOUNDS BETTER

- 2-in-1 digital phone system with multi handset capabilities
- 2.4GHz WDECT wideband digital technology
- Advanced LCD and Caller ID Display*
- 200 Caller ID memories with phone book on handset and base
- Easy menu navigation
- Integrated digital answering machine - with remote access and message indicator light

Uniden WDECT 2355+2
Cordless Phone System

\$229

U0405



Uniden
SOUNDS BETTER

- 2.4GHz Wideband Dect Digital Technology
- Designed and engineered in Japan
- Integrated digital answer machine with remote access
- Multi handset capabilities (up to 4)
- 100 caller ID memories with phone book
- Digital duplex speakerphone on handset and base
- POP ID - caller "name" identification

Uniden ELITE8855
Cordless Phone

\$329

U0572



Bluetooth
Uniden
SOUNDS BETTER

- 5.8GHz Digital Spread Spectrum with In-Built Bluetooth
- Designed and engineered in Japan
- Integrated digital answering machine with remote access
- Multi handset capable (up to 10)
- Distinctive caller ID indicators
- Digital duplex speakerphone on handset
- Downloadable/preset picture displays

Internet Phones

Freshtel 4030 Stickphone

\$69

U0257



Freshtel

- Free Firefly to Firefly calls worldwide
- Free personal Voicemail
- Includes headset
- 128MB memory
- Can be used at internet cafe
- Perfect for travelling

Netcomm V85 VoIP Desktop Phone

\$189

35010



BONUS \$50 MYNET FONE Starter Kit¹

NetComm

- Built-in PC port can connect the phone and a computer using the one network port
- Full duplex speakerphone, 10 number speed-dial, 50 number phone book

Linksys SPA941 IP Business
Phone - 2 Line

\$239

T4759



LINKSYS
A Division of Cisco Systems, Inc.

- Affordable and full featured two or four line business class IP telephone
- Connect directly to an Internet telephone service provider, or connect to an IP PBX
- Up to four lines. Speakerphone. Caller ID. Call hold, transfer, conferencing, blocking and more

PERSONAL COMMUNICATION

Uniden UHF H/held 40ch Ultra
Compact Pers Communicator

\$99

U1265

Uniden
SOUNDS BETTER

An ultra compact portable unit with exceptional range up to 3+ km, 40 licence free channels, range extender capability, and auto battery save.

QUAD PACK



VoIP & Networking Solutions...

Freshtel 2070 USB Phone

\$49 | U0521

- Free Firefly to Firefly calls worldwide
- Free personal Voicemail
- Includes headset
- 128MB memory
- Can be used at internet cafe
- Perfect for travelling

CIT200 Cordless Internet Telephony Kit

\$197

T3126

- Skype with Handset Convenience
- USB Base Station connects to your PC and puts your Skype contact list on the handset's screen



web links

BELKIN
belkin.ht.com.auD-LINK
dlink.ht.com.auENGIN
engin.ht.com.auFRESHTEL
freshtel.ht.com.auLINKSYS
linksys.ht.com.auNETCOMM
netcomm.ht.com.auNETGEAR
netgear.ht.com.auRENTSMART
rentsmart.ht.com.au

Please note: All purchases subject to terms & conditions and returns policy. Delivery charges may apply. Not all items stocked in store but available for pick-up/delivery.

¹Offer available via redemption from Netcomm from 01/12/06 to 31/12/06. Visit netcomm.ht.com.au more details.

²See Box for details. ³Offer available from engin from 01/11/06 to 31/12/06 via redemption. See engin.ht.com.au for more details.

Rentsmart. The figures quoted are based on a per week basis over 3 years. Terms and conditions apply. For details see: rentsmart.ht.com.au

Netcomm Portable V35 VoIP/Skype Spkr Phone USB

\$49 | T4124**SAVE 50%**

The NetComm V35 is a simple to install, easy to use, portable USB hands-free speakerphone for all VoIP or instant messaging clients. By utilising the latest DSP technology, the V35 delivers high quality echo free voice calls.

BONUS \$10 MyNet Fone Starter Kit¹

My Net Fone NetComm V100LS

\$99 | U1220

NetComm

**BONUS \$80 Call Credit²**

- Surf the Internet and make VoIP Calls with one Broadband Service
- Simple to setup and connect
- Low bandwidth consumption
- Use a standard (POTS) telephone
- Standard Telephone audio quality calls

Netgear TA612V Smart Broadband Voice Adapter with engin

\$99 | S9656

NETGEAR

engin
powered

- Turns your Broadband Internet Service into a Telephone
- 2 ports to connect analogue phones and fax machines
- Shares Internet connection via Ethernet ports and Broadband modem
- Prioritises voice traffic for optimum Quality of Service
- Free Caller ID, Call Waiting, Voice Mail and 3 way calling
- Local, long distance, and International calls at low prices
- Sleek, compact design that looks great next to your PC and save space with a vertical stand

Engin 121 Internet Phone

\$159 | T9895engin
powered

DECT cordless internet phone with ATA base station. Base station also has an in-built router and an FXO port so you can make and receive telephone calls from your existing PSTN telephone line.



engin Voice Box Series 2

\$99 | S9649**AFTER CASHBACK | YOU PAY \$199**engin
powered**BONUS \$100 Cashback³****The ultimate box**

- All in one unit allowing you to connect multiple devices such as PCs and notebooks wirelessly to broadband
- Allows you to run two phone lines
- Ideal for the modern home or office

Networking

DM111P ADSL2+ Ethernet Modem Router

\$89 | U0253 **NETGEAR**

- Supports full range of ADSL broadband standards
- Ideal for use with ProSafe™ VPN firewall routers
- Up to 24Mbps downstream & 1.5Mbps upstream
- Auto Uplink™ 10/100 LAN port eliminates need for cross-over cables



XE104 85Mbps Wall Plugged 4 Port Ethernet Switch

\$169 | T9466 **NETGEAR**

- Turns any electrical outlet into a 4 port home network connection
- PCs in different rooms can share a broadband internet connection and share files
- Transfers data at a fast 85Mbps speed with encrypted security



Also Available:

XE103 85Mbps Wall Plugged Single Port Ethernet Adapter | \$129 | T9467

NETGEAR

DG834 ADSL2/2+ Modem Router + 4 Ports

\$97 | L2610



- Integrated ADSL modem, router, switch and firewall
- Future proof with support for ADSL2+
- Network security from a True Firewall with protection from Denial of Service attacks

FS605 5 Port 10/100Mbps Ethernet Switch

\$45 | H1739

- Plug and play installation, no configuration
- Auto-detects speed and duplex
- Auto Uplink™ makes the right connection
- 100Mbps access/200Mbps in full-duplex
- Vertical option saves space on your desk



NetComm®

RAVE III USB Dial up Modem

\$79 | U1312



NEW

- V.92 connectivity
- Send and receive faxes from your PC
- Telephone answering machine support

NB5Plus4W ADSL2+ Wireless Modem Router

\$169 | S1160

- Includes 54Mbps wireless, 4 port Ethernet switch and USB port to cater for a complete range of wireless and wired users



Also Available:

NB5Plus4 ADSL2+ Modem Router \$111 | S1159

NP285 Twin Pack Turbo HomePlug Ethernet Over Power

\$219

T3595



- Create a local area network or share broadband using your power points
- Faster HomePlug standard - up to 85Mbps
- A great way to connect gaming consoles to the internet

LINKSYS®

A Division of Cisco Systems, Inc.

WAG54G Wireless G ADSL 2/2+ Modem Router

\$186

M5307



- ADSL 2/2+ modem with 4 x 10/100 switch ports
- Wireless 802.11g 54MB access point, supports both 11MB and 54MB clients
- Wireless security includes WEP, WPA and 802.1x
- Powerful stateful packet firewall with denial of service attack prevention

WRT54GR Wireless G Broadband Router with RangeBooster

\$179 | T9828

- All-in-one internet-sharing router, 4 port switch, and up to 2X range-enhanced Wireless G access point
- Shares a single internet connection and other resources with Ethernet wired, Wireless G, B, and RangeBooster devices



WRV54G Wireless G VPN Broadband 4 Port Router

\$249 | L5961

- An internet connection-sharing router, switch, and access point with built-in VPN endpoint capability and advanced security features
- Jump start your small business network by connecting both Wireless G (802.11g) PCs, and local wired PCs



BELKIN®

Belkin Home Series Battery Backup 400VA (UPS)

\$99 | T7156

- Battery backup keeps up to 3 devices running in the event of a power outage to ensure your important work can be saved before shutting down
- Protection for up to 4 devices from power surges
- Indicator lights gives a clear visual display of your system status at all times



Belkin Superior Series 6-Way (2m Cord) + TEL + \$150,000 Warranty

\$99 | N3364



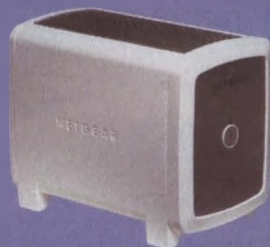
- Provides longer-lasting surge protection with higher joule ratings
- Provides greater spike and lightning absorption with higher maximum spike current ratings
- Features additional protection levels for telephone, ADSL, and cable-broadband lines

Networking and Storage

NETGEAR

SC101 Storage Central

\$175 | 34265



- Share files easily with everyone on the network, while keeping your personal files private
- Setup and configuration are a breeze
- Easy upgradeability through IDE drives*
- Connect via RJ-45 Ethernet

*Hard drives must be purchased separately.

FVG318 Wireless VPN Firewall Router

\$240 | T2399



D-Link

DES-1226G 24 Port Copper Gigabit Smart Switch

\$449 | N9093



web links

BUFFALO
buffalo.ht.com.au

DLINK
dlink.ht.com.au

LINKSYS
linksys.ht.com.au

NETGEAR
netgear.ht.com.au

RENTSMART
rentsmart.ht.com.au

SERVERLINK
serverlink.ht.com.au

Please note: All purchases subject to terms & conditions and returns policy. Delivery charges may apply. Not all items stocked in store but available for pick-up/delivery.

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NETGEAR

GS724T 24 Port Gigabit Smart Switch

\$799 | N3147 **RENTSMART**



- 24 10/100/1000Mbps gigabit ports
- 2 SFP GBIC slots
- Easy, browser-based switch management
- Rackmountable

GS608 8 port Unmanaged Gigabit Switch

\$119 | P0189

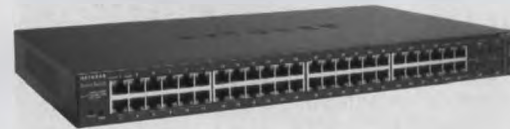


- 8 10/100/1000Mbps Ethernet ports
- Smart-honours 802.1p priority tags, great for VoIP applications
- Flexible-great for PC or Macintosh computers
- Noise free operation for a peaceful work environment

Also available: GS605 5 Port Unmanaged Gigabit Switch | \$79 | P0187

GS748T 48 Port Gigabit Smart Switch

\$1569 | Q9557 **RENTSMART**



- 48 non-blocking 10/100/1000Mbps ports
- 4 SFP GBIC slots for fibre connectivity options
- Smart management features for trunking, VLANs, and traffic prioritisation

SSL312 Prosafe VPN Concentrator 25

\$699 | T8494 **RENTSMART**



- Remote Access – Supports 25 concurrent tunnels and is tailored for the small and mid-sized businesses
- Provides browser based secure access to your corporate network. No client required on the users laptop for remote access
- Uses SSL (Secure Sockets Layer) a protocol popular in the world of e-commerce

D-Link

DGS-1216T 16 Port 10/100/1000Mbps Copper Smart Switch

\$549 | N1045



Also Available:
DGS-1224T 24 Port 10/100/1000Mbps Copper Smart Switch | \$795 | N1047

DGS-1248T 48 Port 10/100/1000Mbps Copper Switch

\$1763 | S0258 **RENTSMART**



Also Available:
DES-1250G 48 Port 10/100Mbps Fast Ethernet WebSmart Switch | \$829 | R3532

LINKSYS

SD205 5 Port 10/100 Switch

\$55
L5968



- 5 autosensing 10/100 switched ports with auto MDI/MDI-X crossover detection
- Up to 200Mbps full duplex bandwidth at each port
- Address Learning and Aging, and Data Flow Control for enhanced transmission reliability

Also Available:
SD208 8 Port 10/100 Switch | \$75 | L5969

SRW2008 8 port 10/100/1000 Managed Gigabit Switch

\$469
T9823



Also Available:
SRW2008P 8 port 10/100/1000 Managed Gigabit Switch with PoE | \$649 | T9825

KVM

SERVERLINK

2 Port Star Cable KVM PS/2

\$59 | Q5539



- Audio and Mic switching for multimedia applications
- Simultaneous or independent PC & audio switching
- Select via hotkey control or push buttons

Also available:

2 Port Star Cable KVM USB | \$69 | Q5540

2 Port ServerLink Dual KVM Switch - USB/PS2/Audio

\$179 | T7536

- Desktop USB + PS/2 KVM switch with audio and microphone switching
- Supports USB or PS/2 computers on every port
- Supports USB or PS/2 on console side
- Multi-platform support for PC, Macintosh G3/G4 and iMAC
- Built-in 2 port USB hub for sharing USB devices



Also available:

SL-461 4 Port USB/PS2 KVM | \$249 | T7537

2 Port ServerLink Slim KVM with 2 x PS2/VGA Cables

\$92 | Q5542



- Integrated 15 pin connector for PS/2 keyboard, monitor and mouse interface
- Compatible with PS/2 style desktop and notebook PCs
- Host powered via PS/2 interface
- Includes 2 x 1.2m 3-in-1 slim KVM cable PS2/VGA

Also available:

4 port model | \$186 | Q5543

BUFFALO Distributed by **Uniden**

Buffalo LinkStation 250GB Network Storage Centre

\$299 | U0708

- 250GB network attached storage
- Compatible with Windows, Mac and Linux Systems
- Additional drive capacity via USB 2.0 ports
- Managed backups over the network or via USB 2.0 to external storage
- Built-in print server^
- Built-in FTP server
- Minimal power consumption and scheduleable auto-power off
- Internal power supply

^Multifunction printers are not supported



NEW

HOT PRICE

When you purchase a Linkstation 250GB Network Storage Centre you will receive a BONUS Wireless Ethernet Converter. ONLY WHILE STOCKS LAST!

Buffalo Home Server TeraStation 1TB Network Storage Centre

\$1299 | U0663

- 10/100/1000 Gigabit Ethernet port and Jumbo Frame capability for higher transfer speeds
- Built-in print server for sharing and managing a USB printer on the network. (May not function with certain USB printers)



NEW

Buffalo Business Server TeraStation 1TB Network Storage Centre

\$1599 | U0705

- 10/100/1000 Gigabit Ethernet port
- UPS compatibility to allow automatic or manual shutdowns safely when power is interrupted (Serial Port)
- High Speed Processor with Serial ATA Hard Disk
- Active Directory Support and Quick Swap drives via front door panel



NEW

Buffalo LinkStation Pro 500GB Network Storage Centre

\$699 | U0707

- Simplified file sharing for home or small office network
- Works as a client in an Active Directory domain allowing LinkStation Pro to utilise the domain users and groups
- High speed processor, DDR-II Ram, and SATA hard drive provide ultra fast transfer rates
- Control access with group and user level security
- Access data from any Windows or Macintosh computer on your network
- Two or more LinkStations can be used to back up each other over your network
- Easy setup does not require drivers



NEW

Also Available:

Buffalo LinkStation Pro 320GB Network Storage Centre | \$499 | U0706

ADSL, Broadband & Wireless

D-Link
Building Networks for People

DWL-G520 108Mbps Wireless G
PCI Adapter

\$79 | H9622



- Up to 108Mbps
- Works with 802.11b devices
- Great for video streaming
- 802.11g, 802.11b compatible
- Increased security with 802.1X and WPA

Also Available:
DWL-G650 108Mbps Wireless Notebook
Adapter | *\$79 | H9621

DWL-G122 Wireless G Portable
USB Adapter

\$59 | P3058

DWL-G510 Wireless G PCI
Adapter

\$45 | S0663

DWL-G630 Wireless G
Notebook Adapter

\$48 | S1164

web links

D-LINK
dlink.ht.com.au
LINKSYS
linksys.ht.com.au
NETCOMM
netcomm.ht.com.au
NETGEAR
netgear.ht.com.au
RENTSMART
rentsmart.com.au

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D-Link
Building Networks for People

DSL-G604T Wireless G
ADSL2/2+ Modem Router

\$150 | P3062



- ADSL2/2+ modem router with 54Mbps wireless and built in 4 port switch
- Built-in SPI Firewall, DHCP server
- 4 port fast Ethernet and 802.11g wireless connectivity

DI-524UP 54Mbps Wireless
Router with Print Server

\$129 | T0646



- Built-in 4 port fast Ethernet switch
- Advanced Firewall features, VPN pass through
- WEP, WPA & 802.1X Security
- UPNP enabled
- Built-in USB print server

DI-524 Wireless G Router +
4 Port Switch

\$99 | S0650



- 54Mbps high-speed wireless broadband Internet access
- 802.11g Standard, 802.11b Compatible
- Built-in 4 port Fast Ethernet switch for ready server connection

DWL-3200AP 108Mbps
Wireless LAN Access Point

\$397 | T5891



- 802.11g 108Mbps wireless connectivity
- Supports WPA-personal, WPAenterprise, 802.1x, AES
- Also works as wireless distribution system with AP
- Wireless frequency range: 2.4GHz to 2.4835GHz

NETGEAR

WPN824 RangeMax Wireless G Router

\$179 | R5401



- Up to 1000% more wireless coverage and speed than 802.11g
- RangeMax™ Smart MIMO Technology
- 7 Internal Smart Antennas adapt on the fly to interference

Also Available: WPN311 RangeMax Wireless G PCI
Adapter | \$109 | R4066

WG111 Wireless G USB Adapter

\$49 | N6536



- 54Mbps standard 802.11g wireless internet access – 5x the speed of 802.11b
- New antenna technology allows wireless access at ranges greater than ever before

Also Available:
WG311 Wireless G PCI Adapter
| \$42 | J8554

WPN511 Wireless G RangeMax
Notebook Adapter

\$112 | R4068



- Up to 1000% the coverage and range of 802.11g, when used with the WPN824
- Easy setup via Smart Wizard install assistant
- Works with all standard 802.11g and 802.1b wireless routers and access points

Also Available: WPN111 Wireless G RangeMax
USB Adapter | \$129 | Q3512

DG834G ADSL 2/2+ 54Mbps Wireless G
ADSL Modem Router

\$159 | L2609



- Combines modem, router, switch, 802.11g access point, and SPI True Firewall
- Up to 5X faster than 802.11b
- True Firewall with Stateful Packet Inspection (SPI) & Intrusion Control, Denial of Service (DoS), Virtual Private Network (VPN) pass-through

Networking

NetComm®

NP3680 Multi-Function Print Server

\$199 | T9846



NEW

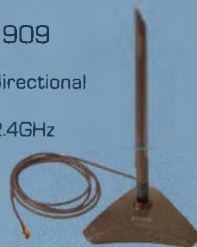
- Easily share 2 x USB 2.0 hi-speed devices on your network
- Designed for an extensive range of standard and multifunction printers even allowing for ink level reporting
- Connect and share USB hard disks, flash drives and card readers

D-Link®
Building Networks for People

ANT24-0501 Indoor 5dBi Gain Omni-Direct

\$66 | S7909

- 5dBi Gain omni-directional antenna
- Compliant with 2.4GHz ISM band
- For indoors use with 802.11b/g wireless devices



Also Available: ANT24-0700 Indoor 7dBi Antenna | *92 | S0749

DCS-G900 Wireless Internet/
Surveillance camera for Home/SOHO

\$299 | U1191

NEW

- Web-based Remote Access using any ActiveX™ or Java™-enabled web browser
- 802.11g Wireless connectivity
- Scheduled, motion triggered or manual recording options



LINKSYS®
A Division of Cisco Systems, Inc.

WRVS4400N Wireless N
Gigabit Security Router

\$479 | U1235

NEW

- Wireless N offers greater speed and coverage than Wireless G, while at the same time being backwards compatible with 802.11B and G devices
- SPI Firewall, and Intrusion Prevention secure the work from outside threats



WAP4400N Wireless N Access Point
with Power over Ethernet

\$359 | U0056

NEW

Draft 802.11n wireless networking delivers greater throughput and extended range, maximising the number of wireless clients per access point for your small business



Also Available: WPC4400N Wireless N Business Notebook Adapter | \$249 | U1238

WRT300N Wireless N
Broadband Router

\$279 | T7735

- Internet-sharing router and 4 port switch, with a built in speed and range enhanced Wireless Access Point
- MIMO technology uses multiple radios to create a robust signal that travels up to 4 times further and reduces dead spots



WMP300N Wireless N PCI Card Adapter

\$199 | T7740

- High-speed Wireless N (draft 802.11n) networking for your desktop computer
- MIMO technology uses multiple radios to create a robust signal that travels up to 4 times further and reduces dead spots



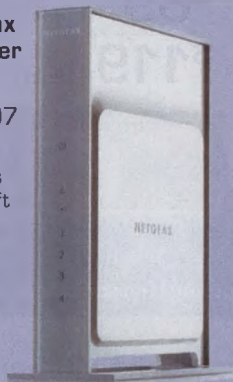
Also Available: WPC300N Wireless N notebook adaptor | \$219 | T7738

NETGEAR®

WNR834B RangeMax
NEXT Wireless Router

\$279 | T7507

- Speeds of up to 270Mbps and is compliant with draft 802.11n
- Delivers a steady-stream reliable connection that supports multiple simultaneous users and applications



DG834N RangeMax NEXT
ADSL Modem/Router

\$399 | T7509

- Complies with draft 802.11n, backwards compatible with 802.11b/g WiFi
- Interoperates at 270Mbps with other products powered with Intensi-fi
- Ensures optimal performance with internal antenna design

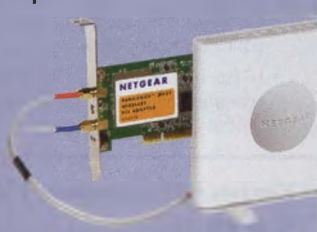


WN311B RangeMax NEXT
Wireless PCI Adapter

\$189

T9167

- Complies with draft 802.11n, backwards compatible with 802.11b/g WiFi
- Delivers stable, application enhancing connections using Steady-Stream technology
- Interoperates at up to 270Mbps with other products powered with Intensi-fi™



WN511B RangeMax NEXT Wireless
Notebook Adapter

\$199

T7508

- Complies with draft 802.11n, backwards compatible with 802.11b/g WiFi
- Interoperates at 270Mbps with other products powered with Intensi-fi™
- Ensures optimal performance with internal antenna design



USB, Memory Cards & Portable Drives...

SanDisk Mini SD Cards

**\$59** | 1GB | R9345**\$109** | 2GB | T6172

SanDisk Compact Flash

**\$99** | 2GB | P5253**SAVE \$6**

Seagate Compact Flash Type II

**\$149** | 4GB | T3725

web links

KINGSTON
kingston.ht.com.au
LACIE
lacie.ht.com.au
MAXTOR
maxtor.ht.com.au
SANDISK
sandisk.ht.com.au
SEAGATE
seagate.ht.com.au
WESTERN DIGITAL
westerndigital.ht.com.au

Please note: All purchases subject to terms & conditions and returns policy. Delivery charges may apply. Not all items stocked in store but available for pick-up/delivery.

¹ Memory stick only

SanDisk Cruzer Micro U3 USB Drives

\$49 | 1GB | T7526**\$89** | 2GB | T8375

SanDisk Cruzer Titanium U3 USB Drives

\$69 | 1GB | T8478**\$119** | 2GB | T8480

U3 Smart Drives Offer You.

Ultimate portability | Private & protected computing | Personalised computing on shared PCs

Sandisk SD Card With Micromate Reader

\$49 | 1GB | U0097**\$89** | 2GB | U0098**BONUS Micromate Reader**

Sandisk Memory Stick Pro Duo With Micromate Reader

\$79 | 1GB | U0093**\$129** | 2GB | U0096**BONUS Micromate Reader**

Now with the MicroMate Reader you can also:



- Easily transfer files between a variety of consumer electronics devices: digital cameras/camcorders¹, handheld gaming¹, mobile phones, PDAs or computers
- Keep a memory card in the reader and use it as a USB Flash Drive
- Carry it with you so you always have access to your important data
- Hi-Speed USB 2.0 certified for fast data transfer (also compatible with USB 1.1)
- Compact, easy to carry

Kingston DataTraveler II + MIGO

\$79 | 1GB | U1378**\$139** | 2GB | U1379

DataTraveler II Plus Migo Software USB 2.0 Flash drive is the most multifunctional drive you'll ever own. Ideal for small-office and home users as well as mobile professionals and students.



Kingston DataTraveler Elite Privacy

\$109 | 512MB | U1380**\$169** | 1GB | U1381

DataTraveler Elite combines advanced security with outstanding performance.

- Protect even your most sensitive data on Windows based systems
- USB 2.0 Fast transfer Flash Drive
- Safely carry digital files wherever your business takes you

3 WAYS TO SHOP
CALL
CLICK
VISIT

Maxtor

Maxtor OneTouch III 2.5" External Hard Drives

\$99

40GB | T9382

- USB 2.0 and 1.1 compliant interface
- 5400RPM 8M cache
- Weighs 205 grams
- Maxtor OneTouch button - the easy way to make backup copies of your files
- Two levels of security with Maxtor DriveLock and Encryption to safeguard against unauthorised use
- System Rollback - rolls back your PC settings to a better point in time while keeping data current



SAVE \$50

LaCie 120GB Mobile 2.5" External Drive

\$199 | U1315

- USB 2.0
- 5400RPM 8MB cache
- Ultra portable hard drive
- USB Bus-powered, plug and play
- Sturdy metal, slim design

NEW CAPACITY

Seagate 2.5" External Hard Drives

Seagate

\$229 | 120GB | U0101

- 5400 RPM 8MB cache
- USB 2.0 interface
- USB Bus powered
- 5000 Gs nonoperating shock resistance
- Weight: 292 grams

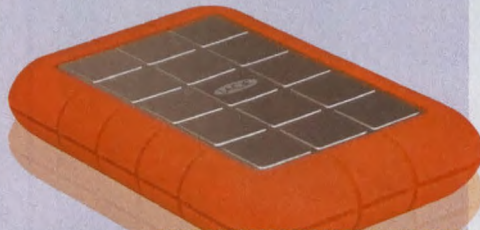
SAVE \$20



LaCie Rugged Mobile 2.5" Hard Drive

\$399 | 120GB | T6203

- USB 2.0, FireWire 400 & FireWire 800
- 5400RPM 8MB cache
- Rugged, portable storage for people on the go
- Scratch-protected aluminium shell and shock-resistant rubber bumper
- Weighs 250 grams



BONUS CASE



harris technology



Storage

Maxtor OneTouch III 2.5" External Hard Drive

Maxtor

\$199 | 100GB | T6328



SAVE \$30

Seagate 5GB Pocket Hard Drive

Seagate

\$89 | Q3001

SAVE \$50



- Built-in, retractable USB 2.0 cable
- 3600RPM drive with 2MB cache
- Small size, large capacity, high performance

Western Digital Passport 6GB Pocket Drive

WD Western Digital

\$179 | T8998

- Rotating USB 2.0 connector
- Fits easily in a purse or pocket
- Moving data from Mac to PC or from PC to Mac computers
- Includes WD Sync synchronisation and encryption software that lets you save your critical data, and take it with you



LaCie Skwarim 60GB Pocket Drive

LaCie

\$299 | T7306

- Unique creation of world-renowned designer Karim Rashid
- Plug and play, USB 2.0 bus-powered, cross-platform
- PC and MAC compatible



Call 1300 13 9999 | Click ht.com.au | Visit our stores

December 06

Hard Drives...

Seagate

Seagate Mirra Sync and Share
Personal Server Drives**\$699** | 320GB | U0613
\$7.83/wk * RENTSMART**\$799** | 500GB | U0614
\$8.95/wk * RENTSMART

Breakthrough File Management and Protection Storage Solution. Mirra combines an always-on network server with powerful software and online services. Together, this system allows you to easily manage, protect, share, sync and enjoy all your valuable files and data—from anywhere.

- Sync content automatically between PCs and/or Macs
- Securely share content with co-workers, customers, friends and family with password protection and controlled access features
- MirraGuard Data Protection Guarantee protects you from data loss if your PC or Mac hard drive fails

web links

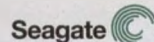
LACIE
lacie.ht.com.au
MAXTOR
maxtor.ht.com.au
RENTSMART
rentsmart.ht.com.au
SEAGATE
seagate.ht.com.au
WESTERN DIGITAL
westerndigital.ht.com.au

Please note: All purchases subject to terms & conditions and returns policy. Delivery charges may apply. Not all items stocked in store but available for pick-up/delivery.

Rentsmart: The figures quoted are based on a per week basis over 3 years. Terms and conditions apply. For details see: rentsmart.ht.com.au

Maxtor One Touch III
Turbo External Hard Drives**\$799**| 1TB | RAID 0/1
| T4613 | \$11.19/wk * RENTSMART**\$200 PRICE DROP**

- User-configurable RAID solution. Use RAID 0 for high performance disk striping or RAID 1 for automatic mirroring
- FireWire 800 for fast data transfer
- 7200 RPM, 16MB cache
- Maxtor DriveLock™ protects contents of drive in case of loss or unauthorised use

**MASSIVE 1TB STORAGE**Seagate Pushbutton Backup
3.5" External Hard Drives**\$259**

300GB | T6581

SAVE \$20

- USB 2.0 and Firewire
- 7200 RPM 16 MB Cache
- 350 Gs nonoperating shock resistance
- The interlocking design lets you securely expand your Seagate storage
- The drives are safeguarded by built in self monitoring technology that continuously checks your hard drive for data safety and drive performance

WD My Book Premium
Edition External Hard Drive**\$249**

250GB | U0066

\$50 PRICE DROP

- Easy to set up, easy to use. Installation is a snap because you don't really "install" this drive, you just plug it in and it's ready to use
- Dual interface, for all-out, high-speed performance, FireWire 400 is the interface of choice

Maxtor OneTouch III 3.5"
External Hard Drives**\$299**

300GB | U0248



- USB 2.0 and Firewire
- 7200RPM up to 16MB cache
- Maxtor OneTouch button - the easy way to make backup copies of your files
- Two levels of security with Maxtor DriveLock and Encryption to safeguard against unauthorised use

Maxtor Ethernet
Shared Storage Plus Drives**\$339**

300GB | Q1270

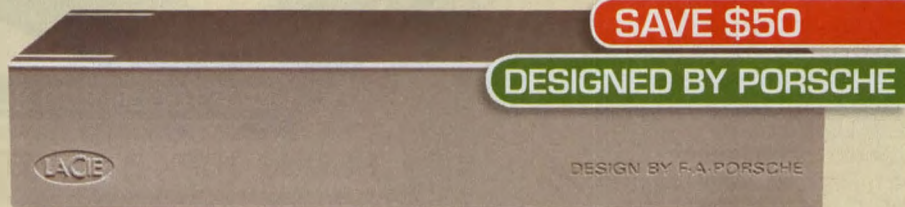
Shared Storage and Backup
For Small Office and Home Networks

- 2 USB ports let you add shared network printers or external storage
- Access files from multiple PCs simultaneously
- 7200 RPM, 16MB cache

LaCie 500GB 3.5" External Hard Drive

\$349 | T9416

- Hi-speed USB connection
- Save photos, MP3s, data files
- Back up valuable information
- 7200 RPM 8MB Cache
- Stackable to save desk space
- Simple setup and easy to use



Seagate 3.5" External Hard Drive

\$199 | 250GB | T7268

Protect valuable data and digital memories for years to come! This easy to use external drive is a safe and affordable way to protect everything from business files to your treasured digital memories.

- USB 2.0
- 7200RPM 2MB cache
- Compact, lightweight and cost-efficient storage
- Easy storage and access for large digital music, photo, video, personal data and multimedia files



Maxtor Basics 3.5" External Hard Drives

\$229 | 320GB | U0569

Your work, your photos, your songs, your digital video, your memories. Store them all safely and securely in the Maxtor Personal Storage 3200 external hard drive.

- USB 2.0 and 1.1 compatibility
- 7200 RPM, up to 16MB cache
- Easy add-on storage for home or office
- Compact design includes stand for vertical orientation
- PC compatible



LaCie d2 Ethernet Disc Mini

\$379

250GB | S5488

\$67/wk* RENT SMART

SAVE \$20



- Fast Ethernet 10/100 & hi-speed USB 2.0 interface
- File sharing on the network
- Secure storage solution
- 7200 RPM, 8MB cache
- Designed for Windows®, Mac® and Linux systems

Seagate eSATA External Hard Drive

\$469

500GB | T9400

\$748/wk* RENT SMART

SAVE \$30

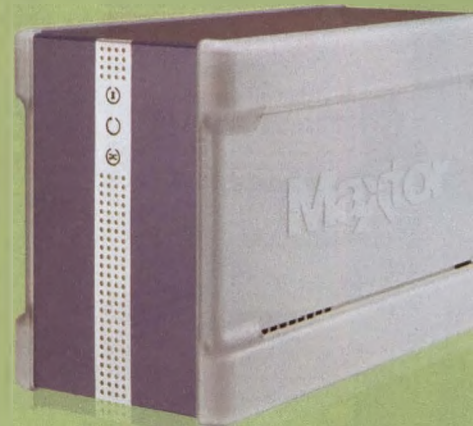


- 7200 RPM 16MB Cache
- Up to five times faster than existing external storage solutions (USB 2.0, FireWire)
- Provides external data backup and protection at speeds up to 3-gigabits/second interface rate
- Integrates the award-winning Seagate SATA drives with Native Command Queuing (NCQ)

Storage

Maxtor Shared Storage II

\$1129 | 1TB | T9385



- Automated back up for photos, music, video and data on networked PCs and Macs to one location
- Automatic mirroring of 500GB data
- Access files from multiple PCs and Macs simultaneously
- Easy installation with automatic network configuration
- Set privacy levels for shared folders with easy browser interface
- SimpleView™ provides quick backup and storage status
- 1000/100/10Mbps Gigabit Ethernet connection

LaCie BigDisk Extreme Drive

\$949 | 1TB | T6655



- FireWire 800, FireWire 400, Hi-speed USB 2.0
- Built-in RAID 0 for extreme FireWire 800 speed
- Convenient: plug & play, stack, rack-mount or stand upright
- Featured with Kensington cable lock slot

Optical Drives

Verbatim
Verbatim DVD+R DL
InkJet Printable - 20Pk
\$89 | S8528

**SAVE \$5**

Verbatim DVD-R
InkJet Printable 50Pk
\$34 | R8527



Verbatim Lightscribe
20Pk DVD+R Slim Case
\$26 | R8528



web links

APPLE
apple.ht.com.au
BELKIN
belkin.ht.com.au
LACIE
lacie.ht.com.au
LOGITECH
logitech.ht.com.au
SAMSUNG
samsung.ht.com.au
SANDISK
sandisk.ht.com.au
SONY
sony.ht.com.au
RENTSMART
rentsmart.ht.com.au
VERBATIM
verbatim.ht.com.au

Please note: All purchases subject to terms & conditions and returns policy. Delivery charges may apply. Not all items stocked in store but available for pick-up/delivery.

¹Bonus is bundled with product. Available from 01/11/06 to 31/12/06. See sony.ht.com.au for details.

**Sony DVDirect Computer-Free
Multifunction DVD Burner**

\$399 | U0610

- Connect via USB, DV (i.Link/IEEE1394/Firewire), Composite (RCA), or S-Video
- Transfer video/photos DIRECT to DVD - no PC required
- Multi-card reader for standalone or PC mode
- Built-in 2.5" LCD screen
- Directly print digital photos
- Combine multiple mini-DVDs into one full sized DVD
- Comprehensive Nero software suite supplied

**ONE TOUCH DVD BURN****BONUS 10PK DVD MEDIA¹****SONY**

**LaCie DL Lightscribe 16x
DVD±R/RW External Optical Drive**

\$149 | T3116

- Large 8.5GB double layer DVD+R9 media
- Hi-speed USB interface
- Features innovative LightScribe labeling technology
- PC and MAC compatible



**Samsung Lightscribe Double
Layer External Optical Drive**

\$155 | T8961

SAVE \$20

- Light-scribe functions
- Interface: USB 2.0
- Double Layer: DVD+R 5X(8.5GB), DVD-R 4X(9.4GB)
- Writemaster technology
- Buffer Under Run Free technology
- Live update
- Nero or Pinnacle software is bundled in the retail box

**Sony DRXS50U Slimline
8x DVD±R/RW External Optical Drive**

\$229 | U0611

- Super slim design
- Supports virtually all DVD and CD formats
- Power-burn technology
- Easy plug & play connection



**LaCie DL Slim 8x DVD±R/RW
External Lightscribe Optical Drive**

\$229 | S8317

SAVE \$20

- Multi-format, double layer recording
- Hi-speed USB 2.0 interface
- Store 8.7GB of photos, MP3s, videos
- Comes with PC burning software
- USB 2.0 Bus powered

MP3 & Accessories...



Apple iPod Video

\$380 | 30GB | BLACK | U0429
| WHITE | U0430

\$499 | 80GB | BLACK | U0432
| WHITE | U0433



Authorised
Solutions Reseller

Apple iPod Nano

\$219 | 2GB | SILVER | U0418

\$299 | 4GB | SILVER | U0423
| PINK | U0427
| GREEN | U0428
| BLUE | U0426

\$380 | 8GB | BLACK | U0438

SanDisk MP3 Player E250 2GB



\$199 | T7641

- Sleek design with 1.8" TFT colour screen
- Store music, videos and photos
- Features micro SD expansion slot for additional memory
- User replaceable, rechargeable Lithium Ion battery

SanDisk MP3 Player M240 1GB



\$90 | U0126

- 1GB of memory plays back over 16 hours of MP3
- Supports Microsoft PlaysForSure downloads and subscription
- Up to 19 hours continuous playback using one AAA battery (included)
- Support for MP3, WMA, and DRM WMA and Audible file formats



Samsung YP-K5 4GB MP3 Player



\$369 | U0135

- 1.5W in-built slide out stereo speaker set
- Striking design with vivid, animated OLED screen
- Unique one touch keypad
- Automatic switch to speaker mode
- FM Radio with presets



Sony MP3 Flash Memory Walkman 2GB Black



\$199 | U0640

- 3 minute rapid USB re-charge
- FM tuner
- Built-in USB plug
- Compatible with MP3, ATRAC & AAC music files



Audio Accessories

Sony Ex Series Earphones MDREX32



\$59
BLACK | U1287



NEW

Sony Ex Series Earphones MDREX52



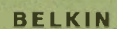
\$89
BLACK | U1285
WHITE | U1286



NEW

- Performance 9mm driver unit
- Compact & lightweight

Belkin TuneBase FM For iPods



\$125 | T8541

SAVE \$10

The versatile TuneBase FM plays your iPod tunes through your car stereo-as it powers and charges your device.



Logitech mm50 Portable Speakers



\$199
BLACK | T7692
WHITE | S8264



Logitech Z-10 Interactive

\$299
U1280

NEW

- Touch-sensitive multimedia controls
- Innovative LCD display shows song information



PC Accessories...

Logitech Harmony 525
Advanced Universal Remote

\$179

U0606

- Control your home entertainment system at the touch of only one button
- Easy to use with its activities (watch cable, watch a DVD, play a videogame...)



Logitech Harmony 880
Remote Control

\$295

S9725

- Easy to use with its activities watch cable, DVD & video games
- Interactive color display
- Optimised for complicated HDTV and PVR systems



Logitech Harmony 785
Advanced Universal Remote

\$363

U0607

- Choose "Watch DVD" and the Harmony turns on your TV, DVD, Stereo receiver- even presses play!
- Controls 3,500+ brands, 125,000+ devices so you're always in control



web links

DVICO

dvico.ht.com.au

HAUPPAUGE

hauppauge.ht.com.au

LOGITECH

logitech.ht.com.au

MICROSOFT

microsoft.ht.com.au

PLANTRONICS

plantronics.ht.com.au

Please note: All purchases subject to terms & conditions and returns policy. Delivery charges may apply. Not all items stocked in store but available for pick-up/delivery.

¹Via redemption from Microsoft. See microsoft.ht.com.au for terms and conditions

Logitech G15 Gaming Keyboard

\$169 | U1252

The Ultimate Gaming Keyboard

- Adjustable-tilt, backlit LCD display shows information during game play
- Set timers to keep track of game events
- 18 programmable "G Keys" to execute macros with a single button press
- Ideal for FPS and role playing games
- Customise keyboard to your gaming preference
- Automatically turns off the "Windows" key, so hitting that button accidentally won't end your game



Logitech G3 Gaming Laser Mouse

\$79 | U1279

NEW

- Customise with SetPoint software for selected game detection
- In-game adjustable sensitivity
- Independent x- and y-axis settings



Logitech V450 Laser
Cordless Mouse for Notebooks

\$89 | U0117

NEW

- Precision laser tracking
- Ergonomic design with soft rubber grips
- 2.4GHz digital cordless technology for strong connections and no interference



Microsoft LifeCam VX3000

\$99 | T9681

- 1.3 megapixel resolution
- Built-in microphone
- Windows Live™ call button
- Universal attachment base
- Digital pan, tilt and zoom
- Automatic face tracking



Microsoft LifeCam VX6000

\$149 | T9680

BONUS MICROSOFT
LASER MOUSE OR
\$40 CASHBACK¹

- High definition video (1.3 megapixels) and photos (5.0 megapixels interpolated) show you in the best light
- Built-in microphone
- Windows Live™ call button
- 71-degree wide angle lens

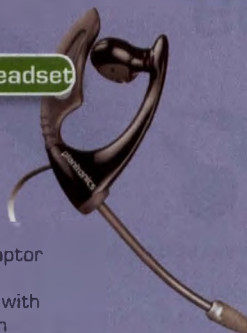


Plantronics MX500i Headset

\$89 | U0120

Under the ear VoIP Headset

- VoIP headset with USB adaptor
- Pivoting speaker
- Stable and comfortable fit with innovative Flex Grip® design



Plantronics Discovery 640
Premium Bluetooth Headset

\$163 | T2527

The Discovery 640 Bluetooth wireless headset from Plantronics delivers pioneering styling in a small, ultra lightweight design.



Batteries

Logitech Cordless Desktop
MX 5000 Bluetooth Laser

\$245 | T3579



- The smart desktop that combines an LCD keyboard display, high-speed Bluetooth wireless hub with SecureConnect technology

Microsoft Optical Desktop **Microsoft**
Elite for Bluetooth

\$299 | P7009

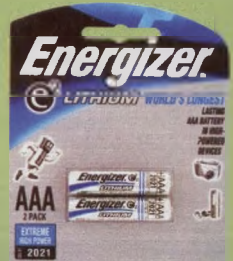


- High performance wireless Bluetooth desktop
- Features ultimate keyboard and mouse navigation with Tilt Wheel technology

Energizer Lithium AAA Battery 2Pk

\$12⁹⁸

U0925



Energizer Lithium AA Battery 4Pk

\$19⁹⁸

U0924



Energizer Lithium AA Battery 2Pk

\$10⁹⁸ | U0923

Energizer Recharge AA Battery 4Pk

\$22⁹⁸

U0931



Energizer Recharge AAA Battery 2Pk

\$13⁹⁸ | U0929

Energizer Recharge AA Battery 2Pk

\$12⁹⁸ | U0930

Energizer Charger

\$34⁹⁸

U0927



Logitech VX Revolution

\$129 | T9955

Ultimate notebook mouse



- New, revolutionary, hyper-fast scroll wheel
- Performance laser
- One-touch search
- High-resolution zoom

Logitech diNovo Media
Desktop Bluetooth Laser

\$320 | T3582



- Bluetooth® MediaPad — long range Bluetooth® remote commander
- Combines a numeric pad, calculator & remote control
- LCD display and rechargeable MX laser mouse

Logitech QuickCam Fusion

\$159 | T3586



- Monitor front design provides improved eye-to-eye contact
- Provides true 1.3 megapixel sensor quality
- High quality audio via a built-in microphone

Logitech QuickCam
for Notebooks Pro

\$165 | T5700



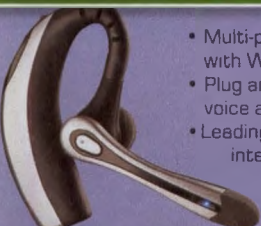
- Enjoy natural video conversations from your laptop
- True 1.3 megapixel sensor with RightLight™ technology

Plantronics Audio 910
Voyager USB Headset

\$199 | U0121

PLANTRONICS

VoIP Bluetooth Headset



- Multi-point Voyager headset with WindSmart technology
- Plug and Play USB Bluetooth voice adapter
- Leading softphone integration with Personacall software

Logitech Premium Notebook
Headset

\$99 | U1277



NEW



Designed specifically for the needs of notebook users, the Premium Notebook Headset features a behind-the-head, adjustable design that folds flat for travel.

Mono Laser... Perfect for Office Networks

HP 3000N Colour LaserJet

\$1499T3252 | \$16⁹⁰/wk*RENTSMART

It's your choice!
Switch Colour on or off

Who prints in colour is now in your hands. You can now switch on or off colour by user, department or application.

- Fast 29ppm mono and 15ppm colour printing
- Affordable mono CPP
- Standard HP Jetdirect print server
- 160MB memory
- HP PCL6, HP PCL5, HP Postscript Level 3 emulation
- 6,500 black and 3,500 colour page toner[^]

[^]Based on 5% page coverage

Also Available:

HP 3000DN Colour LaserJet

T3254 | \$1690 | \$18⁹⁴/wk*RENTSMART

web links

BROTHER

brother.ht.com.au

CANON

canon.ht.com.au

DOUBLE A

doublea.ht.com.au

FUJI XEROX

fujixerox.ht.com.au

HP

hp.ht.com.au

LEXMARK

lexmark.ht.com.au

RENTSMART

rentsmart.ht.com.au

SAMSUNG

samsung.ht.com.au

Please note: All purchases subject to terms & conditions and returns policy. Delivery charges may apply. Not all items stocked in store but available for pick-up/delivery.

¹Bonus Nokia 6060 mobile phone by redemption from Harris Technology on purchases of the HP 4250N, 4250TN and 4250DTN from 01/12/06 to 31/12/06. Visit hp.ht.com.au for redemption form and full details.

Rentsmart: The figures quoted are based on a per week basis over 3 years. Terms and conditions apply. For details see: rentsmart.ht.com.au.

Fuji Xerox Docuprint 203a

\$99 | T0506

- Print Speed: up to 20ppm (A4)
- Resolution: up to 2400 x 600 dpi
- Memory: 8MB
- First page out: 10 seconds
- Warranty: 1 year

Toner 2500pg yield | T3238 | \$69



Network Ready

X FUJI XEROX



HOT PRICE

Limited stock

Lexmark E120N Laser Printer

\$179 | T7001

- Print Speed: up to 19ppm (A4)
- Resolution: up to 600 x 600 dpi
- Memory: 16MB
- Network ready
- Warranty: 1 year

LEXMARK



A3 Printer

HP 5200 A3 Mono Laser

\$1729 | \$19³⁶/wk*RENTSMART | T7719

- Print Speed: up to 19ppm (A4)
- Resolution: up to 600 x 600 dpi
- Memory: 16MB
- Network ready
- Warranty: 1 year



HP LaserJet 1022

\$310 | R9103

- Print Speed: up to 18ppm
- Resolution: true 1200 dpi
- Memory: 8MB
- Processor: 266MHz processor
- Connectivity: hi-speed USB 2.0 port



HP LaserJet 1022N

\$499 | R9104

- Print Speed: up to 18ppm
- Resolution: up to 1200 dpi
- Interface: hi-speed USB, Ethernet 10/100Base-TX
- Networking: print server - Ethernet, fast Ethernet
- Processor: 266MHz
- Memory: 8MB

Printers

Samsung ML-2571N

SAMSUNG

\$329 | U0583



2 Year On-Site Warranty

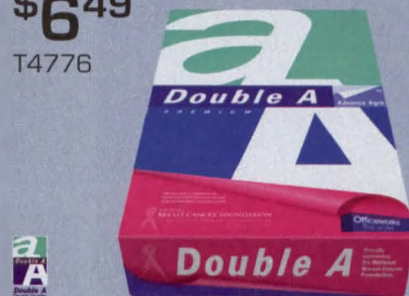
The ML-3051ND's extremely powerful CPU of 400 MHz and memory of 16MB (expandable to 272MB) make for an unbeatable combination for optimal performance and a more efficient and productive work environment.

Conserve toner and paper with instant-touch Toner Save which boosts toner productivity by 40% (from 4,000 to 5,600 pages).

Double A A4 500 page ream

\$649

T4776



Double A A4 2500 page box

\$31⁹⁰

T4779



HP LaserJet 4250N

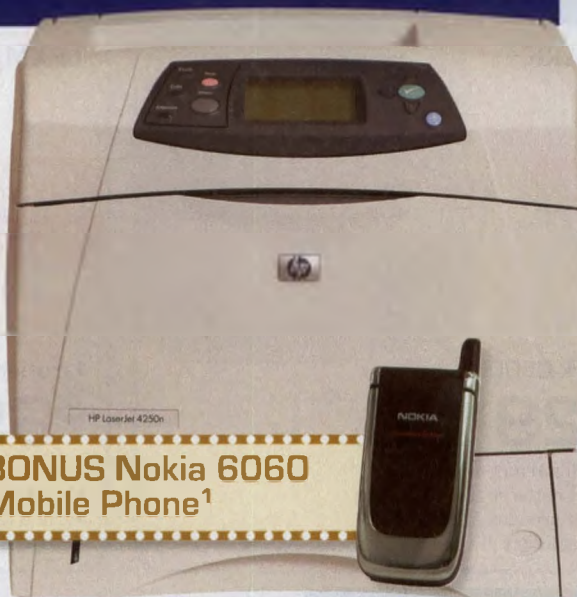
\$2275

Q2900 | **RENTSMART**

The HP LaserJet 4250 increases workgroup productivity with fast print speeds up to 45ppm and less than 8 seconds for the first page out. A 460MHz processor, expandable memory, industry-leading internal networking, and genuine HP printing supplies round out this printer's performance features.

- Print Speed: up to 43ppm B/W A4
- Max Resolution: 1200 dpi
- Interface: parallel, hi-speed USB, Ethernet 10/100Base-TX
- Processor: 460MHz
- RAM Installed: 64MB
- Total Media Capacity: 600 sheets
- Monthly Duty Cycle: 200,000 pages

BONUS Nokia 6060 Mobile Phone¹



Also Available:

HP LaserJet 4250TN | Q2894 | **\$2699** | **RENTSMART**

HP LaserJet 4250DTN | Q2890 | **\$3299** | **RENTSMART**



Samsung ML-3051ND

\$949 | U0955

The ML-3051ND's extremely powerful CPU of 400MHz and memory of 16MB (expandable to 272MB) make for an unbeatable combination for optimal performance and a more efficient and productive work environment.

Conserve toner and paper with instant-touch toner Save which boosts toner productivity by 40% (from 4,000 to 5,600 pages).

Duty cycle: 100,000 pages/month

SAMSUNG



NEW

2 Year Warranty

Brother Laser HL-5250DN

\$479 | T3555

- Print Speed: up to 28ppm
- Resolution: up to 1200 dpi
- Memory: 32MB
- Interface: parallel, USB 2.0, Ethernet
- Duplex printing standard
- Network ready

brother

2 Year Warranty

HP LaserJet 1320

\$589 | P9319

- Print Speed: up to 22ppm, letter (up to 21ppm, A4)
- Resolution: 1200 dpi
- Memory: 16MB RAM
- Media input: 250 sheet tray
- Automatic duplex built in
- Duty cycle: 10,000 month



Colour Business Printers...

Samsung CLP-300N

Colour Laser

\$559

RENTSMART

U0104 | \$6²⁶/wk**SAVE \$30**

Easy toner-change system

- World's smallest and lightest colour laser printer
- 26 second first page out time
- Inbuilt 10/100 ethernet card
- Toner monitoring software so you always know how much toner you have left
- 1 year on-site warranty

web links

DOUBLE A

doublea.ht.com.au

FUJI XEROX

fujixerox.ht.com.au

HP

hp.ht.com.au

KONICA MINOLTA

konicaminolta.ht.com.au

LEXMARK

lexmark.ht.com.au

RENTSMART

rentsmart.ht.com.au

SAMSUNG

samsung.ht.com.au

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¹By redemption from Konica Minolta. Valid from 01/12/06 to 31/12/06. For full details visit konicaminolta.ht.com.au.

²By redemption from Konica Minolta. Valid from 18/09/06 to 31/12/06. For full details visit konicaminolta.ht.com.au.

³Bundled with product. While stocks last.

⁴Offer available via redemption from HP between 01/09/06 and 15/12/06. For redemption form and full details visit hp.ht.com.au.

LEXMARK

NEW



Lexmark C500N

\$529

|U1367

- Up to 31ppm mono, 8ppm colour
- Ethernet network-ready
- 200 Mhz processor with 64MB
- Print resolution: 1200 x 600 dpi

LEXMARK

NEW

HOT PRICE



Lexmark C522N

\$699

|U1368

- Up to 19ppm in mono or colour
- Print resolution: 1200 x 1200 dpi
- 312.5 Mhz processor with 128MB RAM
- Ethernet-ready 10/100BaseTX

BONUS Wacom Biz Tablet¹

Konica Minolta 2500W

\$457

|U0122

- Print speed: up to 20 ppm mono, up to 5ppm colour
- Resolution: 2400 x 600 dpi
- Interface support: Hi-Speed USB 2.0
- Memory: 32 MB RAM
- 1 year warranty

EXCLUSIVE Extended Offer²
BONUS \$100 CASHBACK OR 1.5K CMY TONERS

Konica Minolta Magicolor 2530DL

\$599

|U0076

- Print speed up to 20ppm mono (A4/letter), 5ppm colour
- Resolution up to 9600 x 600 PhotoArt Contone
- 128MB RAM standard memory (max. 640MB)
- PostScript 3, PCL5, PCL6
- 200 sheet multipurpose paper tray

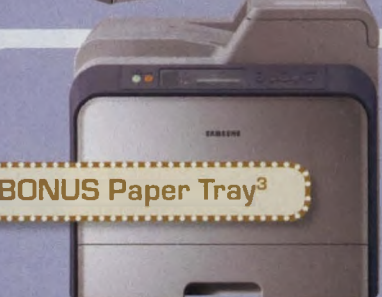
BONUS Paper Tray³

Samsung CLP-550N

\$789

|P9392

- Printing speed: 5ppm colour and 20ppm mono
- Memory: 128MB
- Resolution: up to 1200 x 1200 dpi effective output
- Windows and Macintosh (OS 8.6+) compatible
- 250 sheet tray, 100 sheet MPF
- Ethernet and USB 2.0
- 1 year on-site warranty

BONUS Paper Tray³

Samsung CLP-600N

\$849

|T6828

- Fast 20ppm in colour and mono
- Inbuilt network card allows you to share the printer easily
- Smart panel software alerts you to toner low and empty notifications
- 1 year on-site warranty



3 WAYS TO SHOP CALL
CLICK VISIT

harristechnology



Printers

SAVE 10%

ON ALL HEWLETT PACKARD 3000, 3600, 3800 SERIES COLOUR LASERJET PRINTERS

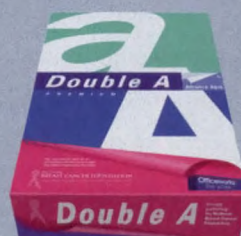


PART	PRICE	SAVE
T3243 3600	\$835	\$94
T3244 3600N	\$989	\$110
T3250 3600DN	\$1,349	\$150
T3251 3000	\$1,099	\$130
T3252 3000N	\$1,349	\$150
T3254 3000DN	\$1,529	\$170
T3255 3800	\$1,159	\$130
T3256 3800N	\$1,394	\$155
T3258 3800DN	\$1,799	\$200

Double A A4 500 page ream

\$649

T4776



Fuji Xerox DocuPrint C525A

\$399 | R6445

HOT PRICE BREAKTHROUGH

Amazing colour and fast black and white print. The DocuPrint C525A offers great value for you who needs high speed black and white print and high quality colour outputs at a small price.

- High speed 25 pages per minute black and white and 5 pages per minute colour gives you the speed plus the option of colour
- Quick, first colour page in under 17 seconds; 8 seconds for black and white
- 64MB of standard memory ensures that you can print complex documents



X FUJI XEROX

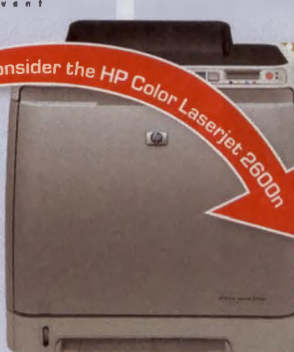
HP Colour LaserJet 1600 Printer

\$489 | T6120



HP Colour LaserJet 2600N Printer

\$589 | S2505



**BONUS \$100 Coles
Myer Gift Card⁴**

CLJ2600n has the same specifications as CLJ1600
PLUS Standard Networking
PLUS Higher Duty Cycle
PLUS Mac/Apple OS support
PLUS Higher yield toner⁴ in box
⁴4500 more pages in the box.

- Up to 8ppm, mono and colour
- Single-sheet priority feed slot
- 600 x 600 dpi with HP ImageREt 2400
- 16MB RAM, memory enhancement technology
- 264MHz Motorola CFV4e processor

BONUS Coles Myer Gift Card
offer ends December 15, 2006

HP 2605DN Colour Laserjet Printer

\$799 | T7115



- High performance with brilliant colour laser printing
- Fast 12ppm mono and 10ppm colour printing
- Automatic double sided printing
- Built in HP PCL6 and Postscript 3 level emulation
- Built-in 10/100 Base-T Ethernet/Fast Ethernet print server
- 64MB standard memory
- 250 sheet input tray



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Myer Gift Card⁴**

Also Available | HP Colour Laserjet 2605DTN

T7113 | \$899 | **RENT SMART**

Call 1300 13 9999 | Click ht.com.au | Visit our stores

December 06

Multifunction Laser/Fax...

Epson AL-CX11NF Colour Laser MFP including Fax

\$1399

S8454 | \$15⁶⁸/wk* RENT SMART



EPSON

- High speed printing at up to 25ppm (mono) and 5ppm (colour)
- Sharp text and dynamic images with an effective print resolution of 2400 dpi (RIT)
- Optical scanning resolution up to an enhanced 9600 dpi
- Epson's Wrap Transfer System for added speed and accuracy of toner placement
- Epson AcuBrite Toner for vibrant and detailed prints
- Full faxing capabilities with up to 60 speed dials
- Auto document feeder for easy and quick copying and faxing

web links

BROTHER

brother.ht.com.au

CANON

canon.ht.com.au

EPSON

epson.ht.com.au

HP

hp.ht.com.au

LEXMARK

lexmark.ht.com.au

RENTSMART

rentsmart.com.au

SAMSUNG

samsung.ht.com.au

Please note: All purchases subject to terms & conditions and returns policy. Delivery charges may apply. Not all items stocked in store but available for pick-up/delivery.

*Offer available via redemption from HP between 01/09/06 and 15/12/06. For redemption form and full details visit hp.ht.com.au.

Rentsmart: The figures quoted are based on a per week basis over 3 years. Terms and conditions apply. For details see: rentsmart.ht.com.au.

Samsung SCX-4200 Mono Laser 3-in-1 MFP

\$279 | T6637

SAMSUNG

- Print/copy/scan
- Up to 18ppm print and copy speeds
- Up to 600 dpi effective output resolution
- Stand alone mono digital copier
- Colour scanner [includes OCR software]
- Standard memory: 8MB
- 250-sheet cassette, 1-sheet manual tray
- 1 year warranty



Samsung SCX-4521F Mono Laser 4-in-1 MFP

\$499 | T6638

SAMSUNG

- Print speed: up to 20ppm
- Copy speed: up to 20cpm
- Resolution: up to 600 x 600 dpi
- Compact flatbed design
- 4800 dpi enhanced colour scanning
- 33.6Kbps fax modem, 3 second transmission
- 1 year warranty



Canon MF8180c Colour Laser MFP

\$1349 | T6868

Canon
advanced simplicity

- Brilliant quality colour and mono printing equivalent to 9600 x 600 dpi
- Prints up to 19ppm mono and 4ppm colour with no warm up time
- Uses Canon's unique Hi-SCoA compression technology for super fast printing
- Scan at up to 48 bit colour depth at 1200 x 2400 dpi resolution
- 33.6Kbps Super G3 fax



Brother MFC-9420CN 5-in-1 MFP

\$1479 | T4070

brother

- Print and copy speed: 31ppm mono and 8ppm colour
- Colour laser super G3 fax 33.6Kbps
- Colour flatbed laser digital copier
- Standard memory: 64MB (Max: 576MB)
- Scanning resolution: 1200 x 2400 dpi
- Colour flatbed scanner
- PC fax send/receive



Brother MFC-8860DN Laser Multifunction

\$1049 | T6910

brother

- Print/copy/scan/fax
- Print and copy speed: 28ppm
- Print resolution: 1200 x 1200 dpi
- 33.6K Super G3 Fax
- 32MB Memory
- Built in duplex
- Network ready
- 2 years RTB warranty



Samsung SCX-5530FN Mono Laser Multifunction

\$1229 | T9643

SAMSUNG

- Print/copy/scan/fax
- Print speed: 28ppm mono
- Direct to USB scanning
- Direct from USB printing
- USB and Ethernet
- Scan to Ethernet
- Scan to network
- 1 year on-site warranty



3 WAYS TO SHOP CALL
CLICK VISIT



HP 2840 Colour Laser All-in-One

\$1499 | \$16⁹⁰/wk RENT SMART | S1217

- Print speed: 20ppm mono, 4ppm colour
- Resolution: up to 600 x 1200 dpi
- Memory: 96MB RAM
- Capacity: 375 sheets
- Network connection



Also Available | HP Colour LaserJet 2820
\$1445 | S1223 | \$16⁹⁰/wk RENT SMART

BONUS \$100 Coles Myer Gift Card¹

¹BONUS Coles Myer Gift Card
offer ends December 15, 2006



BONUS \$50 Coles Myer Gift Card¹

HP 3050 All-in-One Printer

\$499 | T4389

- Print/copy/scan/fax
- Print speed: up to 18ppm
- Scan: 600 dpi optical
- Fax: 33.6Kbps
- Memory: 64MB RAM
- 1 year warranty



BONUS \$50 Coles Myer Gift Card¹

HP 3055 All-in-One Printer

\$749 | T4390 | \$8⁹⁰/wk RENT SMART

- Print/copy/scan/fax
- Print speed: up to 18ppm
- Scan: 1200 dpi optical
- Fax: 33.6Kbps
- Memory: 64MB RAM
- 1 year warranty
- Network connection



BONUS \$50 Coles Myer Gift Card¹

HP 3390 All-in-One Printer

\$1079 | T4392 | \$12⁹⁰/wk RENT SMART

- Print/copy/scan/fax
- Print speed: up to 21ppm
- Scan: up to 1200 dpi optical
- Fax: 33.6Kbps
- Memory: 64MB RAM
- 1 year warranty
- Network connection



Brother 2820 Laser Fax Machine

\$349

S1320

brother

- Mono laser faxing
- Fax: 14.4Kbps fax modem
- Best transmission speed: approx. 6 seconds per page
- Standard memory: 8MB memory
- Fax page memory: up to 400 pages
- Dual access: Yes



Lexmark X342N Mono Laser Multifunction

\$549 | T9729

LEXMARK

- Print and copy speed: up to 25ppm
- Scan: up to legal size documents in colour or mono with a 50 page automatic document feeder
- Fax: up to 33.6Kbps modem with 10 speed-dials
- Software included to help you create and organise digital documents from your scanned originals



harris technology

Printers

HP Colour LaserJet CM1017 Multifunction Printer

\$1229

U0877 | \$13⁷⁷/wk RENT SMART



NEW

- Print /copy/scan
- Print speed: up to 8 ppm (mono), up to 8 ppm (colour)
- Print resolution: up to 600 x 600 dpi (mono) / up to 600 x 600 dpi (colour)
- Scanning resolution: 1200 x 1200 dpi
- Standard memory: 96MB
- Improve efficiency with built-in network connectivity. Integrated 10/100 Base-TX networking
- 2.4" colour graphical display

Also Available:

HP Colour LaserJet CM1015 MFP

U0876 | \$999 | \$11⁹⁹/wk RENT SMART

Double A A4 2500 page box

\$31⁹⁰

| T4779



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December 06

Single Function Inkjet Printers...

Canon iP90 Portable
Bubblejet

\$429

R8579



- Print Speed: 16ppm mono 12ppm colour
- Resolution: 4800 x 1200 dpi
- FINE print head technology for impressive speed & photo quality
- PictBridge ready - connect & print!
- Optional Bluetooth adaptor for wireless printing

Also available:

Car charging kit | N0292 | \$127

web links

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brother.ht.com.au

CANON
canon.ht.com.au

EPSON
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hp.ht.com.au

RENTSMART
rentsmart.ht.com.au

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¹By redemption from Canon. For full terms and conditions visit canon.ht.com.au. Valid for purchases made between 01/11/06 to 31/01/07.

²Bonus 6 month magazine subscription by redemption from HP. Valid for purchases of the HP Deskjet F380 All-in-One or HP Photosmart C3180 All-in-One, between 1/10/06 and 24/12/06. Visit hp.ht.com.au for full details.

³Purchase the Epson RX630 between 14/10/06 and 14/01/07 and receive 4 Greater Union or HOYTS movie tickets via redemption from Epson. Visit epson.ht.com.au for details on the selected range eligible, how to enter and full terms and conditions.

Rentsmart: The figures quoted are based on a per week basis over 3 years. Terms and conditions apply. For details see: rentsmart.ht.com.au.

SAVE \$16

Harris Technology Recommends



HP OfficeJet Pro K550DTN

\$449 | T4312



- Print speed: up to 37ppm
- Resolution: up to 4800 x 1200 dpi
- Memory: 32MB RAM
- Trays input: 250-sheet tray, 350-sheet tray
- Duplex: automatic two-sided printing accessory
- 7500 page duty cycle

Also available:

OfficeJet Pro K550 | T3724 | \$329



EPSON
EXCEED YOUR VISION

Epson Stylus R800

\$649 | ^{\$727/wk} RENTSMART | N9471

- Print speed: 17ppm
- Photo: 68 seconds per (8x10") photo image
- New UltraChrome Hi-Gloss™ pigment inks
- True border free printing up to A4



Brother MFC 5840CN
6-in-1 Inkjet Network MFC

\$269 | R0308

brother

- Print speed: 20ppm (mono) 15ppm (colour)
- Resolution: 1200 x 6000 dpi
- Memory: 16MB RAM
- Standard media capacity: up to 350 sheets



A3 Printer

HP Officejet Pro K850 DN

\$799 | ^{\$895/wk} RENTSMART | T7664



- Print speed: up to 24ppm mono and 21ppm colour
- Resolution: up to 4800 x 1200 dpi
- Memory: 32MB RAM
- Trays input: 250-sheet tray, 350-sheet tray
- Duplex: automatic two-sided printing accessory

Also available:

HP K850 | T7665 | \$599 | ^{\$671/wk} RENTSMART

A3 Printer

SAVE \$100



EPSON
EXCEED YOUR VISION

Epson Stylus R1800

\$1079 | ^{\$1224/wk} RENTSMART | S0287

- Print speed: up to 13ppm mono and colour
- Photo 8" x 10" 71 sec
- Resolution: 5760 x 1440 dpi
- Paper hold capacity: up to 120 sheets at 90gsm



Wireless

Brother MFC-640CW 8-in-1
Wireless Inkjet Network MFC

\$299 | T4745

brother

- Print speed: up to 20ppm in mono and 15ppm colour
- Resolution: up to 1200 x 6000 dpi
- Memory: 16MB RAM
- Automatic document feeder: up to 10 sheets
- Digital answering machine

Multi-Function Inkjet Printers...

Canon Pixma 830

\$539 **Canon**
advanced simplicity
| T6987

- Print/copy/scan/fax
- Print: up to 30ppm mono and 24ppm colour
- Copy: up to 29cpm mono and 24cpm colour
- Resolution: 9600 x 2400 dpi print resolution
- 5 individual ink cartridges
- 2.5" colour graphic display



BONUS \$50 CASHBACK¹

BONUS 6 MONTH MAGAZINE SUBSCRIPTION²

Your choice of one of these top titles: Marie Claire, Men's Health, Better Homes and Gardens, Home Beautiful, Girlfriend, Total Girl, K Zone.



HP DeskJet F380 All-in-One

\$84 | U0642



- Printer/scanner/copier
- Print & copy speed: 20ppm black, 14ppm colour
- Scan resolution: 1200 x 1200 dpi / 48 bit colour
- Automatically remove red-eye and enhance detail using HP Photosmart Real Life Technologies



HP Photosmart C3180 All-in-One

\$129 | T7689



- Print/scan/copy with this compact all-in-one
- Print/copy up to 22ppm black & 20ppm colour
- Simple photo printing with or without a PC with the inbuilt card reader
- Print 4x6" photos from as little as 25 seconds



Epson Stylus Photo RX630 Multifunction Printer



\$305 | Q5675

- Print speed: up to 17ppm (mono)
- Resolution: 2400 x 4800 dpi
- Huge 2.4" colour LCD preview screen
- Prints from digital memory cards, direct from PictBridge cameras & direct from USB devices



Canon PIXMA MP530



\$389 | T6982

- Print speed: up to 29 ppm black & 19 ppm colour
- High-speed 6" x 4" photo prints in approx. 51 seconds
- Copy speed: up to 28 cpm black and 19 cpm colour
- Resolution: 9600 x 2400 dpi
- Super G3 high-speed fax

Printers



HP OfficeJet 5610

\$235 | T3163

- Print and copy: up to 20ppm mono and 13ppm colour
- Fax: 33.6Kbps fax modem
- Scan: 1200 x 2400 dpi optical resolution
- 2 line text LCD display
- Junk fax barrier



Epson Stylus CX5700F Multifunction

\$249 | T5925

- Print: up to 20ppm mono and 19ppm colour
- Copy: up to 18cpm mono and 17cpm colour
- Resolution: 5760 x 1440 dpi print resolution
- Maximum fax transmission speed: 33.6Kbps
- Scanning: 1200 x 2400 dpi
- Manufacturer warranty: 1 year

Toner cartridges & Inkjet cartridges...

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PLANET ARKReceive a
COLES MYER
GIFT CARD

when you return your
used Konica Minolta
cartridges and
purchase selected
Konica Minolta
cartridges from
Harris Technology¹



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Photocopier Cartridges Accepted

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KONICA MINOLTA

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HP
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SAMSUNG
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KONICA MINOLTA
konicaminolta.ht.com.au

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¹Visit konicaminolta.ht.com.au for the list of selected cartridges.

"Every year 18 million printer cartridges end up in landfill.
SO DON'T THROW THEM AWAY,
THROW THEM
PLANET ARK'S
WAY!"



Sir Richard Branson
Virgin



CARTRIDGES 4
PLANET ARK



HP Ink cartridges

HP c6578DA No 78 Tri-Colour Inkjet Print Cartridge	S3034	\$53
HP 51645A No 45 Black Inkjet Cartridge	22643	\$49
HP c6615DA No 15 Black Inkjet Print Cartridge	A2595	\$45
HP c8728AA No 28 Tri-Colour Inkjet Print Cartridge	G0252	\$33
HP c8727AA No 27 Black Ink Black Cartridge	G0251	\$29
HP c6656AA No 56 Black Inkjet Cartridge	S2199	\$34
HP c6657AA No 57 Tri-Colour Ink Cartridge	F9886	\$54
HP Y2025AA - No 56A Black Inkjet Cartridge - Twin Pack	S0694	\$56
HP Y2016AA 27/28 Twin pack/HP 27A and HP 28A Combo Pack	S5190	\$54
HP Y2017AA 56A and 57A Twin Combo pack	S5192	\$75
HP Y2025AA No 56A Black Inkjet Cartridge - Twin Pack	S0694	\$56

Canon Ink cartridges

Canon BCI15BK Black Ink Cartridge for i70/i80/iP90 Portable	H8779	\$24
Canon PG-40 Black Ink Cartridge for iP1600 and iP2200	S7128	\$37
Canon BCI-6BK Replacement Black Ink Tank	C3420	\$24
Canon BCI3eBK Black Cartridge BJC3/6xxx S4/5/6/7xx MCPx00	81586	\$21
Canon CL-41 Tri Colour Cartridge for iP1600/iP2200	S9213	\$39
Canon PGI5BK Black Ink Cartridge	S9562	\$26
Canon CLI8BK Photo Black Ink Cartridge	S9587	\$26
Canon CLI8C Cyan Ink Cartridge	S9563	\$26
Canon CLI8M Magenta Ink Cartridge	S9564	\$26
Canon CLI8Y Yellow Ink Cartridge	S9565	\$26
Canon CLI8VP Value pack 1x CLI8BK/C/M/Y & 240 Sheets Paper	T4497	\$93

Canon
advanced simplicity

Brother Ink cartridges

Brother LC-47BK Black Ink Cartridge for DCP-115c/MFC215C/410CN/620CN	Q1657	\$34
Brother LC-47C Cyan Ink Cartridge for DCP-115c/MFC215C/410CN/620CN	Q1659	\$19
Brother LC-47M Magenta Ink Cartridge for DCP-115c/MFC215C/410CN/620CN	Q1660	\$19
Brother LC-47Y Yellow Ink Cartridge for DCP-115c/MFC215C/410CN/620CN	Q1661	\$19

brother

Epson Ink cartridges

Epson T0631 Black Ink Cartridge For Epson C67 Printer	T3404	\$14
Epson T0341 Black Ink For Stylus Photo 2100	F3541	\$19
Epson T0501 Black Ink For SC400/440/460/600/640/670	M4264	\$24
Epson T0511 Black Ink For Stylus 740/760/800/850/860/1160/	M5362	\$34
Epson T029 Tri-Colour Ink For Stylus C60/CX3100	D0044	\$42
Epson T0520 Tri-Colour For Stylus 400,440,460,600,640,670,	M2858	\$34
Epson T027 5 Colour Ink For Stylus Photo 810/830U/925/935	C9765	\$34
Epson T0491 Black Ink For Stylus Photo R310/ RX-510	M0952	\$19

EPSON
EXCEED YOUR VISION

Epson Ink Value Packs

Epson T056 Ink & 20 Sheet Paper Pack	T7642	\$51
Epson T063 Ink & 20 Sheet Paper Pack	T7643	\$49
Epson T049 Ink & 50 Sheet Paper Pack	T7644	\$89



PURCHASE
any 3 specially marked HP Ink packs
and receive a

BONUS

Photosmart A310 Photo Printer

Valued at \$179 (\$20 postage and handling fee per claim)
By redemption from HP. Visit hp.ht.com.au for more information



Eligible HP Inkjet Cartridges:

C6578DA, C1823DA, 51645AA, C6615DA, C8728AA, C8727AA, C6656AA,
C6657AA, Y2025AA, Y2016AA, Y2017AA

HP Toner

P Q6511x LaserJet Black Toner for 2400 Series 12000 Yield	Q4121	\$339
P Q2612A LaserJet 1020/1015/1022/3015/3020 2000 Page Yield	L0381	\$115
P Q5942A Black Toner for 4250/4350 Series 10000 Yield	Q4123	\$219
P Q5949A Black Cartridge 1160/1320 series 2500 Yield	P9322	\$119
P Q5949x Black Cartridge 1320 series 6000 Yield	P9323	\$215
P Q3961A Colour LaserJet 2550/2840 Cyan Toner 4000 Yield	N9527	\$165
P Q3960A Colour LaserJet 2550/2840 Black Toner 5000 Yield	N8595	\$135
P Q3963A Colour LaserJet 2550/2840 Magenta Toner 4000 Yield	N9532	\$165
P Q3962A Colour LaserJet 2550 Yellow Toner 4000 Yield	N9528	\$165
P Q6000A Colour Laser 2600 Black Toner 2500 Page Yield	S5168	\$125
P Q6003A Colour Laser 2600 Magenta Toner 2000 Page Yield	S5172	\$135
P Q6002A Colour Laser 2600 Yellow Toner 2000 Page Yield	S5171	\$135
P Q6001A Colour Laser 2600 Cyan Toner 2000 Page Yield	S5170	\$135

Samsung Toner

Samsung Toner for SCX-4216F MFC 3000 Page Yield	J9653	\$125
Samsung ML 2150/2151N/ 2551n - 8000 Page Toner Cartridge	N1521	\$239
Samsung ML2250 Toner 5000 Page Yield	Q2002	\$149
Samsung CLP-500/CLP-550N Black Toner 7000 Page Yield	M9755	\$145
Samsung CLP-510 5000 page Yellow Cartridge	S2538	\$185
Samsung CLP-510 5000 page Magenta Toner Cartridge	S2537	\$185
Samsung CLP-510 5000 page Cyan Toner Cartridge	S2536	\$185
Samsung CLP-510 7000 page Black Toner Cartridge	S2534	\$169
Samsung ML2010 Black Toner 3000 Page Cartridge	T0776	\$125
Samsung Toner for SCX 4200 3000 Page Yield	T6648	\$125

Brother Toner

Brother TN-2025 Toner for HL-2040 up to 2500 pages A4	R7305	\$79 ⁹⁵
Brother TN-3060 Toner for HL5140/5150D/5170DN/8840/8440 6700 Yield	N1558	\$115
Brother TN-6600 Toner Cartridge for Printer/MFC/Fax - Single	95205	\$115
Brother TN-7600 Toner Cartridge for HL-1650/1670N/+ - Single	C6970	\$119
Brother TN-200 Toner Cartridge for Printer/MFC/Fax - Single	94457	\$44 ⁹⁵
Brother TN-3030 Toner HL5140/5150D/5170D 8840D/8440/8220	N1557	\$84 ⁹⁵

Canon Toner

Canon EP-22 Toner Cartridge LBP800/LBP810/LBP1120	87989	\$84 ⁹⁵
Canon Laser Cartridge for LBP-3000	S1818	\$99 ⁹⁵
Canon CART308 Black Toner for LBP3300 Laser	T6876	\$95
Canon CART301BK Black Toner for LBP5200	S1412	\$144
Canon EP-26 Toner Cartridge LBP3200/MF5650	L7104	\$115
Canon EP87bk Black Toner for LBP 2410 Laser	J2817	\$125

Konica Minolta Toner

Konica Minolta MC 2400 Toner Black [4.5K]	R0703	\$149
Konica Minolta MC 2400 Toner Cyan [4.5K]	R0707	\$215
Konica Minolta MC 2400 Toner Magenta [4.5K]	R0706	\$215
Konica Minolta Magicolor 2400W Toner Yellow [4.5K]	R0704	\$215

Lexmark Toner

Lexmark E120N Return Program Cartridge [2K]	T7314	\$105
Lexmark X342 6000 Page Toner	T9775	\$199
Lexmark X215 Page Toner Cartridge [3.2K]	L5690	\$107

Consumables



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**SAVE 10%
ONLINE**



**BUY ANY
ink or toner**

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during December

2006 and

RECEIVE

10% OFF
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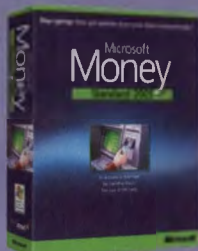


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Microsoft



Microsoft Money 2005 Standard is the personal finance solution that provides fast, current answers to your basic financial questions.

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N6773

Microsoft

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³Purchase any Microsoft Office 2004 for Mac edition from 01/11/06 to 12/02/06 & redeem either a Microsoft wireless notebook mouse or \$50 cashback. See microsoft.ht.com.au for terms & conditions.

⁴Bonus available with purchase of ELOOffice full version. Only while stocks last.

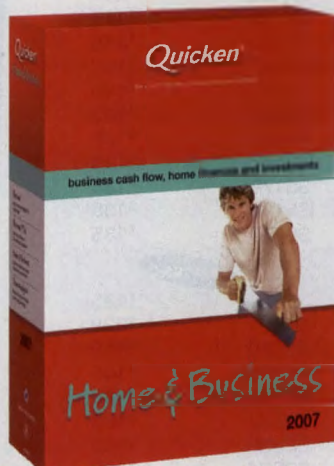
Quicken Personal Plus 2007

\$175 | U0775

Quicken

Easy home finance & investment organiser
Provides tools to help you manage your finances, prepare for tax time and plan for the future, plus exclusive tools to help you optimise your investment portfolio and maximise tax-saving opportunities.

- Track all of your personal and business bank accounts, credit cards, income and expenses
- Monitor all of your personal and business investments
- Budgeting tools to help you save and plan for your future
- Use the new ASIC FIDO superannuation calculator

**BONUS Messenger Bag¹**

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\$425 | FULL | U0822**\$179** | UPGRADE | U0915

Quicken

Business cash flow, home finances & investments

Combines the best of investing and basic business cash flow management to assist you in combining your personal and business finances, allowing you to obtain a complete picture of your financial wealth. It is designed specifically for businesses that operate using a cash-basis accounting method and do not require reporting on outstanding invoices.

- Track all of your personal and business bank accounts, credit cards, income and expenses
- Monitor all of your personal and business investments
- Create BAS and other business tax reports
- Create estimates and invoices
- Use the new ASIC FIDO superannuation calculator

BONUS Messenger Bag¹

QuickBooks Premier 2006/07

\$1499 | T6300

- Time billing and job costing
- Integration with Microsoft Office
- Multiple Currency
- Up to 5 simultaneous users
- Industry specific versions

BONUS²

- 12 months technical Support
 - 12 months product upgrades and updates
 - Priority customer service on a dedicated number
- Terms and Conditions apply²

PRICE DROP

QuickBooks Plus 2006/07

\$499 | T6294

- Invoice, pay bills and track expenses
- Process credit card statements
- Track inventory
- Integrated payroll management
- Integrated BAS and online lodgement

**BONUS²**

- 12 months technical Support
 - 12 months product upgrades and updates
 - Priority customer service on a dedicated number
- Terms and Conditions apply²



Software

ELOOffice

\$499 | FULL⁴ | U0897

\$149 | SME | U0898



BONUS 512MB USB PEN⁴

With ELOOffice, the Electronic Leitz Organizer, filing, processing and archiving is much less complicated and time-consuming. The simple filing principle with archive, filing cabinet, folders and files has been applied in ELOOffice and underpinned with forward-looking technology.

Microsoft

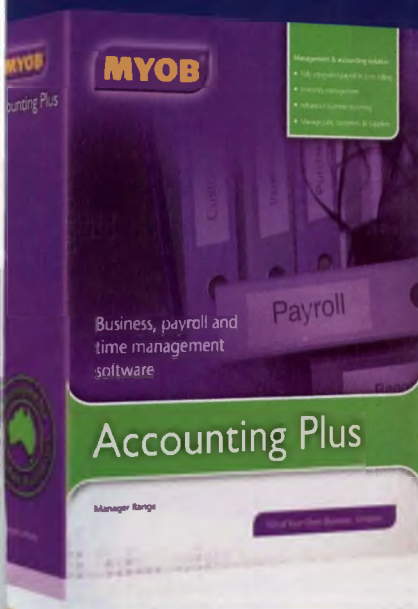
Microsoft Office Mac 2004

\$609 | STANDARD | N6771



BONUS Microsoft Laser Mouse or \$50 Cashback³

Microsoft Office 2004 for Mac is the newest version of the leading productivity suite on the Mac platform developed specifically for Mac users. The productivity suite is packed with features that help users of Mac work smarter and be more productive, allowing them to better manage their information, create documents with confidence and seamlessly share their ideas.



MYOB Accounting Plus v16

MYOB

\$499 | FULL | U0170

\$309 | UPGRADE | U0176

- Automate your payroll
- Bill for your time
- Control inventory
- Process sales and purchases
- Manage receivables and payables
- Track GST and BAS
- Prepare budgets
- Email your quotes and invoices
- Comprehensive business reporting and more



MYOB RetailManager 9

MYOB

\$1729 | U1388

If you're determined to succeed in your Retail business, you need MYOB RetailManager

- Fast customer service
- Advanced inventory management
- Manages promotions easily
- Reports your sales & profit drivers with just a few clicks
- Includes 12 months of 7 day a week support & upgrades
- Integrates with MYOB Accounting, Accounting Plus & Premier

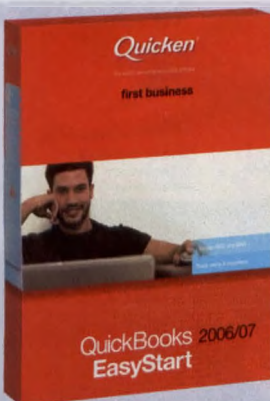


BONUS Scanner

Quicken Retail Starter Kit 2006/07 Hard Bundle

\$919 | T6305

For complete point of sale and back office management - Retail Starter Kit includes everything you need to get started. QuickBooks Plus 2006/07; Retail Point of Sale 2006/07; receipt printer; cash drawer and barcode scanner.



QuickBooks EasyStart 2006/07

\$95 | T6292

QuickBooks EasyStart is a breakthrough in simple bookkeeping for new and home-based businesses. Designed for first-time users of accounting software, EasyStart makes it easy to get started with simple, practical tools to manage essential business tasks.

- Track sales and expenses
- Manage GST and BAS
- Personalise customer invoices with your company logo
- Reconcile your bank account
- Extensive help menu available from within the software program

Quicken

Internet security...

McAfee Internet Security Suite 2007

\$99 | 1 USER
| U0342BONUS TARGUS
ULTRA MINI 4-PORT
USB 2.0 HUB¹

- Prevents viruses from infecting your PC
- Prevents hackers from invading your PC
- Stops unwanted, inappropriate and malicious email
- Protects against spying and pop-up ad programs

CA Internet Security Suite 2007

\$94 | 3 USER
| U0419BONUS \$30
CASHBACK +
\$60 NEW PC
CASH BONUS²

- Anti-Virus
- Personal Firewall
- Anti-Spyware
- Anti-Spam
- Parental Controls

CA Desktop DNA Migrator 2007 - 3 user \$70 | U0441

web links

CA
ca.ht.com.au
KASPERSKY
kaspersky.ht.com.au
MANACCOM
manaccomm.ht.com.au

MCAFFEE
mcafee.ht.com.au
SYMANTEC
symantec.ht.com.au
TREND MICRO
trendmicro.ht.com.au

Please note: All purchases subject to terms & conditions and returns policy. Delivery charges may apply. Not all items stocked in store but available for pick-up/delivery.

¹ Offer available from 01/10/06 to 31/12/06 via redemption from McAfee. For full terms and conditions see mcafee.ht.com.au

² Purchase a full version of CA Internet Security Suite 2006 or CA Desktop DNS Migrator 2007 between 01/11/06 & 24/12/06 & be eligible to receive a \$30 cashback from CA plus a further \$60 new PC cashback. See ca.ht.com.au for full terms & conditions.

³ Offer available from 01/11/06 to 31/12/06 via redemption from Trend Micro. For full terms and conditions see trendmicro.ht.com.au

⁴ Offer available from 25/10/06 to 25/12/06 via redemption from McAfee. For full terms and conditions see mcafee.ht.com.au

⁵ Purchase an eligible Norton product between 15/11/06 & 20/12/06 to be eligible to win one of 8 sony DVD handycams daily. For details on how to enter and terms and conditions see www.symantec.com/aunz-smile

⁶ Purchase Kaspersky Internet Security (12 Month) during December 2006 and receive a bonus additional 12 month license of Kaspersky Internet Security. Visit kaspersky.ht.com.au for more details.

TrendMicro Internet Security 2006

\$89 | FULL | 3USER
| U0389

Trend Micro PC-cillin Internet Security 2007 comprehensively safeguards your computers, home network and personal identity.

Email, shop, share pictures, bank, and instant message - confident that this award-winning security software helps prevent malicious attacks and reduces time-consuming interruptions.

NEW! Online Security Tools

Transaction Guard features a "Spyware Monitor" and "Secret (onscreen) Keyboard". If your computer is stolen, you can access Remote File Lock to secure your files and make them inaccessible to others. Mobile Security safeguards your mobile phone against viruses and other security threats.

BONUS WEBCAM³

McAfee

McAfee Total Protection 2007

\$149 | 3 USER
| U0497

- Offers 10-in-1 Protection and complete online and PC security
- McAfee System Guards watches the computer for specific behaviours that may signal virus, spyware or hacker activity
- McAfee X-Ray for Windows detects and kills rootkits and other malicious App that hide from Windows and other anti-virus programs
- McAfee Site Advisor adds safety ratings to sites and search engine results based on comprehensive spam, adware and online scam safety tests
- Improved McAfee anti-virus, anti-spyware, firewall and anti-spam security work as a multi-layered shield against blend identity theft threats
- Password Vault stores Web login-ins, passwords and personally identifiable information in a secure, password-protected, easy-to-access location

BONUS MOUSE⁴

symantec.

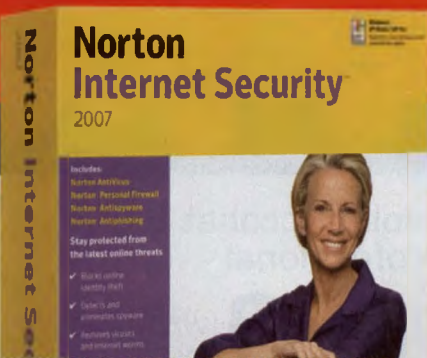
Symantec Business Data Protection Pack

\$899 | U1594

Symantec Backup Exec System Recovery Windows Small Business Server Edition

- Restore your systems anytime, from anywhere to virtually any device
- Set and Protect automated Zero Touch Backup
- Windows Protection

BONUS MAXTOR
PERSONAL STORAGE
3200 320GB



**8 SONY DVD HANDYCAMS
TO BE WON DAILY⁵**



3 WAYS TO SHOP CALL
CLICK VISIT

Norton Internet Security 2007

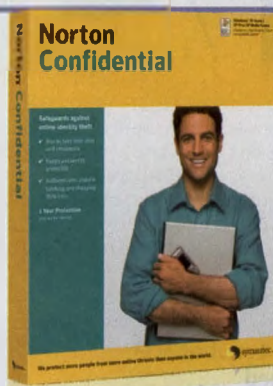
\$89 | FULL | U0335

Stay protected from the latest online threats when connecting to the Web. Norton Internet Security 2007 is always running in the background to detect and block spyware, viruses, worms, phishing Web sites, and hackers before they can cause harm. In addition to protection updates, Norton Internet Security provides new product features as available throughout your service subscription.

Norton Confidential 2007

\$79 | U0710

Safeguard your personal information from online identity theft. Norton Confidential protects you when you're most vulnerable: at a Web site while banking or shopping online, and about to submit passwords, account numbers, or other confidential information. Norton Confidential automatically inspects Web sites—and potentially dangerous or identity-stealing programs on your PC—for known threats and suspicious behavior before you log in, make a purchase, or otherwise interact with them. If a threat is detected, Norton Confidential protects your passwords and other confidential information from an attack—such as getting phished by fraudulent Web sites, or having your keystrokes secretly recorded by identity thieves.



Norton AntiVirus 2007

\$45 **HOT PRICE** | FULL | U0338

\$89 | 3 USER | U0339

Norton AntiVirus 2007 blocks viruses and spyware with advanced protection. It protects your computer by automatically detecting and removing viruses, spyware, unwanted adware, and Internet worms. And it scans and cleans all email and instant messaging (IM) attachments. In addition to protection updates, Norton AntiVirus provides new product features as available throughout your service subscription.

SOLUTIONS FOR SMALL BUSINESS

Symantec Business Protection Pack

\$999 | 10 USER | U1595

Symantec Client Security with Groupware Protection 3.1

- Proactively protects your business from viruses, spyware, hackers and spam
- Protect Servers, Desktops, Laptops and email
- Windows Protection

**BONUS D-LINK DL-624S
HIGH SPEED WIRELESS
STORAGE ROUTER**



harris technology

Software

Kaspersky Internet Security 6.0

\$99

12 MONTH LICENSE | T8781

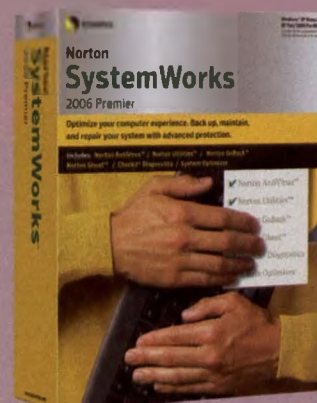
XMAS 2-for-1 OFFER⁶



Kaspersky Internet Security 6.0 combines all the latest technological developments from Kaspersky Lab to protect against malicious code, repel network attacks and prevent spam. All product components integrate seamlessly to prevent system conflicts and ensure high operating speeds for your computer. Kaspersky offers Premier Protection, they are a Global leader in reaction time to Internet threats, automated hourly updates to ensure Protection and free 24 x 7 end user support.

Norton SystemWorks 2006 Premier

\$119 | T0882



Optimise your computer experience with Norton SystemWorks 2006 Premier. This powerful solution offers advanced protection, automatically backing up everything on your computer.

Call 1300 13 9999 | Click ht.com.au | Visit our stores

December 06

Multimedia & Design software...

CorelDRAW Graphics Suite X3

\$655 | T7624

CorelDRAW Graphics Suite X3 is trusted by busy designers and business users to transform ideas into professional results - fast! With this comprehensive graphics suite, users can confidently tackle a wide variety of projects - from logo creation and web graphics, to multi-page marketing brochures, or eye-catching signs.

Microsoft Digital Image Suite Plus 2006

\$167 | T7206

Digital Image Suite PLUS contains both the photo editing tools of Microsoft Digital Image Suite and the video editing tools of Pinnacle Studio.

web links

ADOBE
adobe.ht.com.au
AUTODESK
autodesk.ht.com.au
COREL
corel.ht.com.au
MICROSOFT
microsoft.ht.com.au
TURBOCAD
turbocad.ht.com.au

Please note: All purchases subject to terms & conditions and returns policy. Delivery charges may apply. Not all items stocked in store but available for pick-up/delivery.

¹Purchase this product between 01/11/06 and 12/02/07 and be eligible to redeem a Microsoft Laser Mouse or \$40 cashback via Microsoft. See microsoft.ht.com.au for full terms and conditions.

²Offer available from 01/11/06 to 31/01/07. Saving is calculated on the cost of buying AutoCAD LT 2007 - New Seat (T6088) and AutoCAD LT Subscription - New Seat (T6440) separately.

Adobe CS2.3 Premium

\$2020 | MAC | U1241
| WIN | U1240

Now includes
all-new
Adobe Acrobat 8
Professional plus
Dreamweaver 8!

NEW

Adobe Creative Suite 2.3 Premium software is a highly efficient, unified design environment that combines the latest versions of Adobe's professional design software with Version Cue CS2, Adobe Bridge, and Adobe Stock Photos. It includes all-new Adobe Acrobat 8 Professional software for the most up-to-date Adobe PDF file creation and collaboration and Dreamweaver 8, the industry-leading web development tool.

Adobe Acrobat 8.0 Professional

\$699 | WIN | U1228
| MAC | U1227

ADOBE ACROBAT 8
PROFESSIONAL COMMUNICATE
AND COLLABORATE WITH THE
ESSENTIAL PDF SOLUTION



NEW

Adobe Acrobat 8 Professional software enables business, creative, and engineering professionals to exchange critical documents reliably and efficiently. It offers Adobe Portable Document Format (PDF) file creation from any document.

Adobe Acrobat 8.0 Standard

\$469 | WIN | U1222

Adobe Acrobat 8 Standard software enables business professionals to easily convert any electronic or paper document - even a Web site - to a reliable Adobe Portable Document Format (PDF) file for exchange and review with colleagues and customers.

NEW

ADOBE ACROBAT 8
STANDARD RELIABLY CREATE,
COMBINE, AND CONTROL PDF
DOCUMENTS

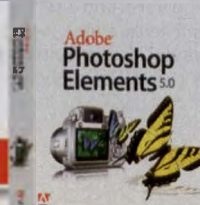


Adobe Photoshop Elements 5.0

SAVE \$14

\$155 | WIN | U0785

Adobe Photoshop Elements 5.0 software combines power and simplicity so you can do more with your photos. Instantly fix flaws or adjust color and lighting with new advanced controls. Quickly drop your photos into customisable layouts and show off your creativity with dynamic web photo galleries created using Flash technology. And view all your photos and video clips in one convenient place.



Adobe Premiere Elements 3.0

\$169 | WIN | U0781

Adobe Premiere Elements 3.0 software makes creating and sharing impressive home videos a snap. Burn your footage to DVD in two simple steps, complete with a DVD menu and scene index, or easily assemble your movie by rearranging clips with drag-and-drop simplicity. And share your movies on DVD, the web, mobile phones, and virtually anywhere else.



Adobe Photoshop Elements 5 & Premiere Elements 3 Bundle

\$249 | WIN | U0783

Adobe Photoshop Elements 5.0 software combines power and simplicity so you can do more with your photos. Instantly fix flaws or adjust color and lighting with new advanced controls. Quickly drop your photos into customisable layouts and show off your creativity with dynamic web photo galleries created using Flash technology. And view all your photos and video clips in one convenient place.



AutoCAD LT®
2007

3 WAYS TO SHOP
CALL
CLICK
VISIT

SAVE \$233²

+ 12 MONTH SUBSCRIPTION[^]



Autodesk

autodesk

AutoCAD LT 2007

\$2199 | U1488

Enhance your productivity with AutoCAD LT software, the world's number one-selling drafting and detailing product. AutoCAD LT 2007 is better than ever.

[^]Subscription gives you the latest software release, product enhancements, web support from technical experts & self-paced online learning

AutoCAD®
2007

AutoCAD 2007
\$6789 | T6087

From conceptual design through drafting and detailing, AutoCAD 2007 enables you to explore ideas like never before.



Autodesk

AutoSketch 9 Windows

\$229 | P7266

AutoSketch software provides a complete set of CAD tools for creating professional-quality precision drawings. Two-minute tutorials get you up and running fast.



Paint Shop Pro Photo XI

\$199 | FULL | U0658

\$139 | UPGRADE | U0893

\$129 | ACADEMIC | U0894

Corel Paint Shop Pro Photo XI is the ideal choice for anyone who wants to create extraordinary photos. From automatic photo fixes to precision editing controls and 100s of special effect filters, these one-of-a-kind photo tools are sure to please anyone with a digital camera. With a built-in photo organiser and a Learning Center to help first-time users get started, Paint Shop Pro is the easiest way to get professional-looking photos - fast.



Corel Snapfire Plus

\$79 | U0659

SAVE \$20

Ignite photo fun with Corel® Snapfire™ Plus! Share photos using creative templates or make entertaining Snapfire Shows - the best way to share groups of photos and video clips. There's even effortless organisation, one click fixes, retouching tools, and automatic backups of your photo collection making, Corel Snapfire Plus the easiest way to work with digital photos.



harris technology



Software

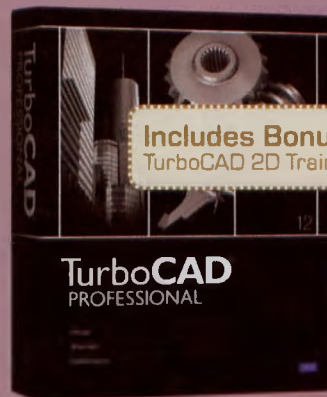
TurboCAD Professional
Version 12

IMSI

\$1125 | T8438

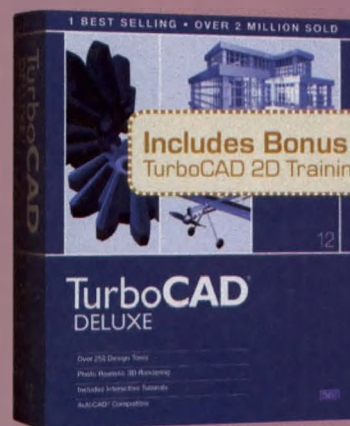
\$279 | T8441

| NON-COMMERCIAL EDITION



Includes Bonus
TurboCAD 2D Training CD

TurboCAD Professional version 12 is a full featured, comprehensive CAD program where precision 2D drafting is fully integrated with 3D solid modelling functionality and photorealistic rendering. TurboCAD delivers unparalleled design productivity and dramatic visual results.



Includes Bonus
TurboCAD 2D Training CD

TurboCAD Deluxe Version 12

\$189 | T8442

TurboCAD® Deluxe version 12 is a powerful 2D/3D full-featured CAD and drafting program that is packed with over 250 professional level drafting tools. TurboCAD delivers more features per dollar than any other 2D/3D consumer CAD product available today. With little or no experience in computer-aided design, you can create accurate 2D sketches, precision drawings, and intricate 3D models with powerful visualisation tools to present your ideas.

Office Applications...

PDF Create! 4.0

\$85

U1301



PDF Create! is the fast, reliable and affordable way to turn all of your PC documents, drawings and images into industry-standard PDF files. Now you can instantly create PDF documents that are compact and easy to e-mail, can be universally viewed on the Web, and that print just as if they came from the original application.

Corel WordPerfect Office X3

Home Edition

\$169

T4592



COREL

Includes 8 essential products:

WordPerfect X3, Corel Photo Album 6 Standard Edition Pinnacle Studio SE, Norton Internet Security 2006, Quattro Pro X3 - Home Edition, Pinnacle Instant CD/DVD LE v8, WordPerfect OfficeReady Personal Finance Essentials, WordPerfect OfficeReady Home and School Essentials.

web links

COREL
corel.ht.com.au
FILEMAKER
filemaker.ht.com.au
MICROSOFT
microsoft.ht.com.au
NUANCE
nuance.ht.com.au
SONY
sony.ht.com.au

Please note: All purchases subject to terms & conditions and returns policy. Delivery charges may apply. Not all items stocked in store but available for pick-up/delivery.

*Offer valid for purchases of PDF Converter Professional 4.0 between 01/11/06 & 28/02/06. Via redemption from Nuance. Standard postage fees apply. For full terms and conditions see nuance.ht.com.au

FileMaker Pro 8.5

\$459 | T9083



Bringing the power of the Net to your database.

FileMaker Pro 8.5 is the newest version of the #1 selling easy-to-use database software that helps you manage people, projects, assets and more - the easy way.

This exciting new version includes the FileMaker Web Viewer that connects your database with the Web data that you rely on everyday - instantly and automatically. Also new is native support for Intel-based Macs, a learning center, new functions, new scripts, and more!

New features include:

- FileMaker Web Viewer
- Custom Web Addresses
- Web Software Integration
- FileMaker Learning Center
- Object Functions & Scripts
- Universal Application



PDF Converter Professional 4.0

\$159 | U0137



Bonus Dragon NaturallySpeaking 'Essentials' 9*

SAVE \$26

PDF Converter Professional 4 gives you everything you need to create, convert, view and edit PDF files - all within one, easy-to-use application. Renowned security and editing capabilities make collaboration and control easier than ever before. Advanced PDF/A technology ensures that your documents will always display and print reliably, while cutting-edge compression techniques pave the way for smaller file sizes and easier sharing. Combine all this with PDF Converter Professional's unique form-filling and conversion technology, and you truly have "Better PDF for Business".



Dragon NaturallySpeaking Preferred Edition 9.0

\$369 | T9230

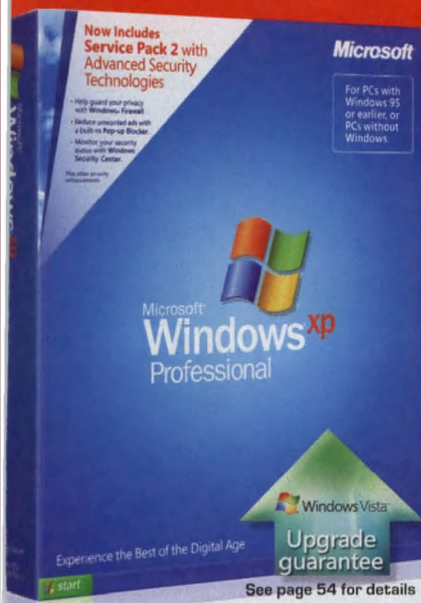


Dragon NaturallySpeaking Preferred 9 gives small business users and PC enthusiasts the power to create documents, reports, e-mails and more-all by speaking! Fast, easy and amazingly accurate, it's over three times faster than typing. Just use your voice to dictate and edit in Microsoft® Word and Excel, Corel WordPerfect, and virtually all Windows-based applications. You can even dictate into a handheld device when you're away from your PC, or use a Bluetooth microphone! It's never been easier to use-no script reading required, so you can get started right away!

Also Available:

Dragon NaturallySpeaking Preferred 9.0 Upgrade | \$265 | T9231

3 WAYS TO SHOP CALL
CLICK VISIT



Microsoft Windows XP Professional

\$319 | UPGRADE | Q0458

\$445 | FULL | Q0447

For users who demand the most from their computing experience, Windows XP Professional includes all the features Windows XP Home Edition, as well as premier security and privacy features, advanced recovery options, an improved ability to connect to large networks and more.

Upgrade from previous versions of Windows 98/Windows 98 SE, Windows Me, Windows NT Workstation 4.0, Windows 2000 Professional, Windows XP Home Edition.

Microsoft Office Small Business 2003

\$429 | UPGRADE | L0827

\$679 | FULL | L0826

Office Small Business Edition 2003 includes the following programs:

- Word 2003
- Excel 2003
- Powerpoint 2003
- Outlook 2003 with Business Contact Manager
- Publisher 2003



See page 54 for details



Microsoft Office Professional 2003

\$779 | FULL | L0804

\$515 | UPGRADE | L0805

In addition to core Office 2003 programs, Word, Excel and PowerPoint, the Professional edition includes:

- Access 2003
- Publisher 2003
- Outlook 2003 with Business Contact Manager



Microsoft Office Standard 2003

\$629 | FULL | L0800

\$385 | UPGRADE | L0801

Office Standard Edition 2003 includes the following programs:

- Excel 2003
- Outlook 2003
- PowerPoint 2003
- Word 2003



See page 54 for details

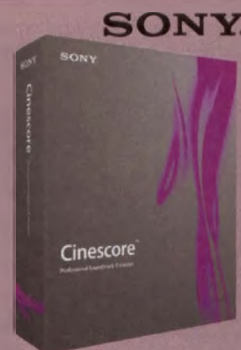
harristechnology **ht**

Software

Cinescore™

\$305

T7239



Cinescore software automatically generates fully composed, multigenre production music using royalty-free Themes in a variety of popular styles. Arrange your media, then create dynamic and effective musical tracks for movies, slideshows, commercials, and radio productions with a single click. Highly customisable, user-defined settings yield an unlimited number of musical choices.

Sony Vegas 7 + DVD

\$669

U0306



The Vegas™+DVD Production Suite combines Vegas 7, DVD Architect™ 4, and Dolby Digital™ AC-3 encoding software to offer an integrated environment for all phases of video, audio, DVD, and broadcast production. Version upgrades also available.

Sony Vegas Movie Studio + DVD 7 Platinum Edition

\$219

U0288



With Vegas™ Movie Studio+DVD Platinum Edition you can import and edit video in nearly any format including HDV. Drag and drop to create movies and slide shows with effects, transitions, and music. Share movies on DVD, PSP™, iPod™, and more. Learn as you go with Show Me How interactive tutorials and included training DVD.

Shop Online and Save...

Online only offers for under your xmas tree

Samsung 215TW 21" Monitor

\$859[^] | U1555

SAVE \$80

Maxtor One Touch III 300GB
Triple Interface External Drive\$314[^] | U1035

HOT PRICE

ONLY 100 AVAILABLE

Apple Mac Mini Core Duo

\$1199[^] | U1553

SAVE \$50

SAVE 10% ONLINE

When you purchase any Ink & Toner, Cordless Phone or External Hard Drive.

Online Only Offers available online only between 01/12/06 and 31/12/06. Delivery charges may apply. Offers not available in Business Centres or via phone. No further discounts available. Only while stocks last. Limited supply per customer (except SA).

Offer subject to Harris Technology's Returns Policy and Terms & Conditions of purchase. [^] Includes discount price.

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- Display accessories shown in photographs throughout this publication are not included in the price.
- All items in this publication have been included in good faith on the basis that the goods will be available at the time of sale. A failure by a supplier to deliver in accordance with sample, description, or at all, may result in some lines being unavailable.
- We reserve the right to limit supply (excluding SA)
- While every care has been taken to ensure accuracy in this catalogue, we reserve the right to change incorrect prices resulting from a printing or typographical error.
- Harris Technology publishes price changes and any other important corrections regarding this catalogue both on its website ht.com.au, through notices in store and and by public notice in The Australian at the earliest opportunity.

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Orders can be collected from one of our locations or delivered, anywhere Australia wide. Delivery charges applicable. Delivery times quoted by sales staff are our best estimates based on information received from the manufacturers. Please inquire about all delivery charges as they vary for locations and items purchased. The estimates indicated right, are offered as a guide only based on off peak state capital metropolitan deliveries. Please call us on 1300 13 9999 or visit ht.com.au for an accurate freight quote based on your order.



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Some items in this catalogue are for delivery only. Delivery charges apply. Call 1300 13 9999 or visit delivery.ht.com.au for details.



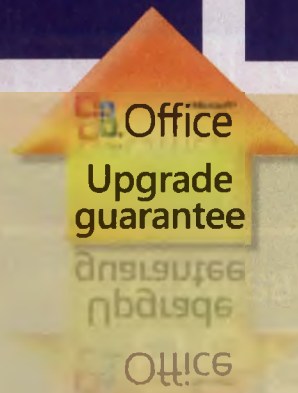
*RENTSMART

The figures quoted are based on a per week basis over 3 years. Standard rentsmart terms and conditions apply.

Windows Upgrade Guarantee

BUY NOW!

MICROSOFT UPGRADE GUARANTEE FOR BOXED SOFTWARE



Purchase specially marked Microsoft products between 26/10/06 and 28/02/07, and **guarantee your NEW upgrade for \$27** including GST, postage and handling.

Buy Microsoft Office 2003 and receive the closest corresponding Office 2007 upgrade.

Buy Windows XP w/SP2 and receive the closest corresponding Windows Vista upgrade.

*Excludes Windows XP Professional w/SP2 Upgrade Academic Edition "Internet access and payment by credit card required for redemption via Microsoft". See in-store for more details or visit www.microsoft.com.au/upgradeguarantee

Corresponding 2007 Edition (Upgrade Microsoft Product) as listed below:

Purchase – Current Microsoft Product	Receive – Upgrade Microsoft Product
Microsoft Office Professional 2003	Microsoft Office Professional 2007 Version Upgrade
Microsoft Office Professional 2003 Version Upgrade	Microsoft Office Professional 2007 Version Upgrade
Windows XP Professional	Windows Vista Business Upgrade
Windows XP Professional Upgrade	Windows Vista Business Upgrade
Microsoft Office Small Business Edition 2003	Microsoft Office Small Business 2007 Version Upgrade
Microsoft Office Small Business Edition 2003 Version Upgrade	Microsoft Office Small Business 2007 Version Upgrade
Microsoft Office Standard 2003	Microsoft Office Standard 2007 Version Upgrade
Office Standard 2003 Version Upgrade	Office Standard 2007 Version Upgrade

How do I Get My Upgrade?

1. Purchase any specially marked Microsoft Windows XP or Microsoft Office 2003 product between 26 October 2006 and 28 February 2007.
2. Download and complete the voucher from www.microsoft.com.au/upgradeguarantee.
3. Send the completed voucher, a copy of your Harris Technology invoice and the box lid of the product purchased to:

Microsoft Upgrade Claim
PO Box 1037
North Ryde NSW 1670

4. The upgrade version of your product will be delivered to you from February 2007.
5. All claims must be received by 5pm (Sydney time) 31 March 2007

Is Your Computer ready for Vista?

Use our free Vista evaluation service to find out and receive 5% off your next purchase. Bring your computer into your nearest Harris Technology store[^], and our Technical Services Team will run a Vista Evaluation Service to determine whether your current hardware and software meet the required specifications to run Vista.

Terms: [^]Selected stores only. Not available in our Parramatta and Alexandria store. 5% off excludes Apple products, clearance items, online only offers and freight. The 5% voucher must be redeemed by 31st January 2007. All purchases subject to Harris Technology standard terms and conditions and returns policy. Evaluation Service is based on the use of Microsoft tools and can be considered as a guide only. Harris Technology is not liable for any loss or damage to data resulting from the use of the Microsoft tool.

Merry Christmas...

1 - 31 December 2008

Acer TravelMate 2482WXM

BEFORE CASHBACK
YOU PAY \$998

\$899

36781

GREAT VALUE

\$99 CASHBACK OFFER¹



¹See page 4 for details

acer

HP LaserJet 4250N

\$2275

Q2900

BONUS Mobile Phone²



²See page 37 for details.

**VISIT ONE OF
OUR EIGHT
BUSINESS
CENTRES..**

NSW

North Ryde
45 Epping Rd

North Sydney

G Floor Bayer Building
275 Alfred St

Parramatta

46 George St

Alexandria

Unit 1/110 Botony Rd

VIC

Hawthorn East
612 Burwood Rd

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